Dental Abstracts

AMERICAN DENTAL ASSOCIATION

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Dental Abstracts

. . . . a selection of world dental literature

Lon W. Morrey, D.D.S., editor
N. C. Hudson, assistant editor

AMERICAN DENTAL ASSOCIATION

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2. To provide, by a few hours' reading each month, a survey of the significant advances being made by dentistry throughout the world, as reflected in current dental literature; and

3. To supply enough data in each abstract so that the reader may determine whether he wishes to refer to the original article for more complete information.

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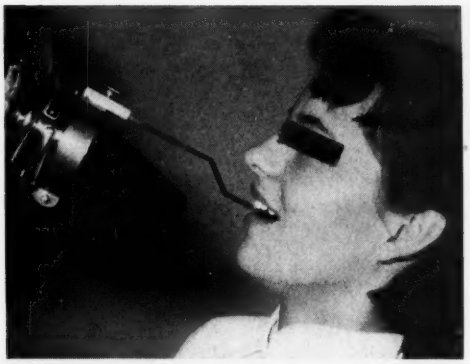
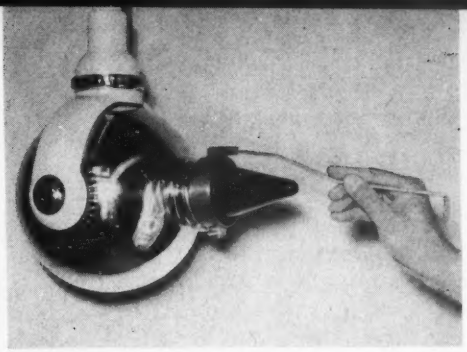


Figure 1 Right angle projection of anterior teeth



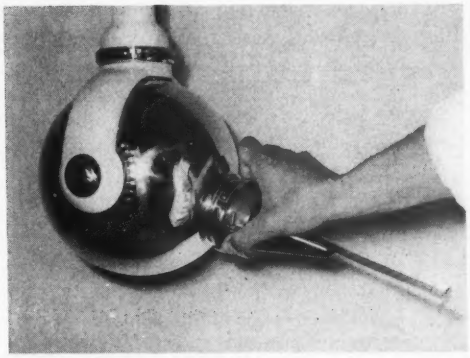


Figure 2 Above: The angulated film holder. Below: The turning rings in action

Oral surgery

▼

Roentgenology

A new roentgenographic technic for practicing dentists

(Eine Röntgenaufnahmetechnik für den Praktiker)

Werner Hielscher. *Deut.Zahnärztebl.* 9:885-890 Dec. 22, 1955

A roentgenographic technic is a procedure involving various factors which, when properly combined, will result in the desired diagnostic roentgenogram. The disadvantages of the Ciezynski-Diek's angle deviation method, frequently used in Europe, are known to many roentgenologists.

The ideal x-ray beam would be composed of parallel rays which permit the formation of shadowy images having exactly the same dimension as the object. Although certain improvements in dental roentgenographic technics have been developed during the last decades, the number of useless roentgenograms (more than 50 per cent) still is far too high.

The roentgenology department of the Dental Institute of the Free University of Berlin has replaced the Ciezynski-Diek's method with a newly developed technic which simplifies the taking of roentgenograms, the procedure, and the interpretation of roentgenograms.

The new technic has been thoroughly tested at the University of Berlin and is now utilized in other German dental institutes and in dental practice.

An "angulated" film holder is fastened to the tube by rings which turn. The film is attached to two plates, an acrylic plate in the front and a metal plate in the back. Because the films must be placed vertically to the central beam, the new method is named the "right angle" technic. Its main principles are as follows: (1) the centric projection on parallel planes (that of the film and that of the tooth axis) can be maintained by holding bars; (2) fixed positioning marks permit "aimed" picture taking instead of "shots at random"; (3) in every position of the patient's head, the film can be placed and kept in a direction parallel to the tooth axis, and (4) when roent-

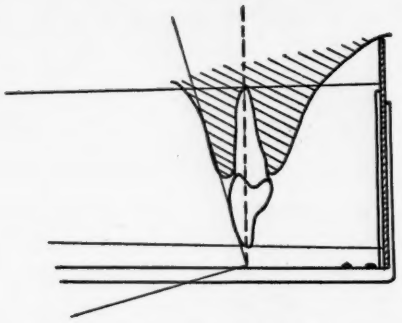


Figure 3 Correct position of the film (incisor)

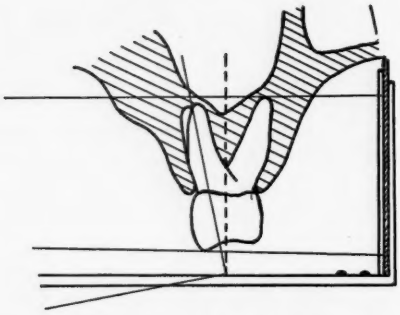


Figure 4 Correct position of the film (upper molar)

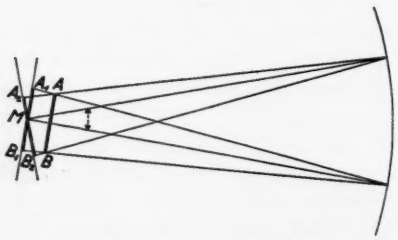


Figure 5 The influence of the vertical angle on longitudinal picture taking

genograms of the anterior teeth are taken, the films should be placed between the cuspid and the second molar; exposures of molars are taken by placing the films approximately in the midline of the palate.

When the patient has an extremely flat palate, the film should be moved to a more inclined position.

With the planes of film and tooth axis equalized, the right angle technic permits more exact roentgenograms than were obtainable by customary methods. The interpretation and evaluation of roentgenograms is easier because the topographic details of all objects appear more correctly represented. Neither opacities nor transparencies appear and misinterpretation is prevented.

The only disadvantage of the right angle technic is the longer exposure time required.

The contrast method in roentgenographic diagnosis of periodontal cysts in upper jaws
(Il metodo di contrasto nella radiodiagnostica delle cisti paradentali nel mascellare superiore)

R. Bandetti and P. L. Banchelli. *Minerva stomat.* 5:9-24 Jan.-Feb. 1956

Periodontal cysts occurring on one side of a tooth usually are caused by degeneration of the epithelium of dental granulomas.

Roentgenographic examinations do not always represent correctly the condition and location of periodontal cysts. Shadows of the teeth and of the osseous structures often veil the position of the maxillary sinus situated anteriorly to the tumoral frame.

Although the customary roentgenographic technic constitutes an important supplement to the investigation of the specialist, it is essential that roentgenograms be interpreted correctly. The desired certainty in roentgenographic diagnosis can only be achieved when the contrast method is used. In this method, the objects are stained with radioactive (radiopaque) substances which permit contrasting effects.

For roentgenographic diagnosis of periodontal cysts, the contrast method developed by Proetz should be the method of choice, because the integrity of the tissues is preserved, no trauma occurs, there is no immediate pain, and manipulation is extremely simple and can be used by any operator.

As an innovation worthy of dental interest, the contrast method whereby double and biaxial roentgenograms are taken after both of the sinuses and pathologic cyst cavities have been rendered opaque by a transdiploic injection, permits surgical, radical and conservative treatment planning based on an exact roentgenographic diagnosis which previously has been unattainable.

Sending x-ray pictures by phone tested by radiologists here and in Philadelphia

New York Times 105:60 July 22, 1956

Roentgenologists in New York and Philadelphia are conducting experimental transmissions of roentgenograms over telephone lines. The tests were conducted for three months between Mount Sinai Hospital in New York City and the Albert Einstein Medical Center in Philadelphia. The transmitted roentgenograms are described as "a bit smaller" than the originals, but clear enough for accurate diagnosis.

The equipment, supplied by the Times Facsimile Corporation, is similar to that used for the transmission of news photographs. Installation cost of a transmitter is estimated at $3,500.

Perfection of the system would enable small hospitals to consult roentgenologists in large medical centers. Isolated industrial plants would be able to obtain expert diagnoses of patients in their clinics. Several roentgenologists in different cities could hold consultations on the same case.

Radiographic incrementation

William R. Patterson. *Oral Surg.,Oral Med. & Oral Path.* 9:885-887 Aug. 1956

Roentgenographic incrementation is a method by which a grid (calibrated in millimeters) is incorporated in the dental film and becomes visible during the developmental process. The grid pattern is placed on the film at the time of manufacture, and is so finely ruled that it does not obscure anatomic detail or interfere with diagnosis. The special film, not available commercially, was designed to study the value of calibrated roentgenograms in oral roentgenography.

Preliminary studies were made regarding the practicality of this method for the following purposes: (1) location of root tips or foreign bodies in the maxilla or mandible; (2) measurement of cystic regions or other intrabony pathologic processes; (3) computation of root canal lengths in endodontic procedures; (4) measurement of edentulous regions to be restored by fixed or removable prosthetic appliances; (5) orthodontic procedures in conjunction with cephalometrics and (6) periodontal pockets, tooth relationship and alveolar crest height.

Film of this type is of value in diagnosis by providing a means for computation and location of certain pathologic processes. Errors of distortion averaged 5 per cent on anatomic specimens. Errors of this magnitude are of no clinical significance. The use of calibrated film in medical, industrial and atomic roentgenography is worthy of further investigation.

Radiation dose reduction by higher voltage dental roentgenography

Lewis E. Etter. *J.A.D.A.* 53:305-309 Sept. 1956

Excessive radiation doses in dental examinations occur because of the use of relatively low kilovoltages (60 to 65 kilovolts) and a relatively great exposure (milliamperes in seconds).

By using the fastest available film, a 16 inch distance with cone and diaphragm, 90 to 100 kilovolts at 20 milliamperes and 3 mm. of aluminum filter, the dentist can reduce the radiation dose to 0.08 r. This requires only an exposure time of 1/10 second.

The dentist can reduce the radiation dose with his present equipment. He can use the highest kilovolt setting of his equipment, usually up to 70 to 75 kilovolts. He can insert 1 or 2 mm. of aluminum filter along with a cut-out lead diaphragm in the tube head opening of the dental x-ray machine and try some exposures using the fastest available film and a 16 inch long cone. If the resulting film seems a little too light or thin, additional development of one minute may help.

In the future, a dental x-ray machine is needed

with a capacity of 90 to 100 kilovolts, 10 to 15 milliamperes, and a timer accurately calibrated at least in one-tenth or preferably one-twentieth seconds. Some manufacturers of dental x-ray equipment are aware of this need and are engaged in research on the problem.

▼ Surgical pathology

Adamantinoma

J. A. Bonta and A. G. James. *Ann.Surg.* 142:1007-1012 Dec. 1955

Although adamantinoma is most common in young adults, it may occur at any age. The presence of a mass in the mandible or maxilla which is slowly growing, relatively asymptomatic, and intimately associated with the bony structure must necessarily include adamantinoma in the differential diagnosis. Roentgenograms are helpful in the demonstration of an expansile mass, often with a multilocular cystic appearance; but roentgenographic findings are frequently not helpful in diagnosis and may be confused with those of dentigerous cysts, giant cell tumor, fibrosarcoma or other bony neoplasms. The final diagnosis must be confirmed by microscopic examination.

The general surgeon or the oral surgeon may not encounter this tumor frequently enough to appreciate its ability to recur locally and to destroy the mandible or maxilla as a functioning structure. As a consequence, he may be tempted to treat this tumor by curettage or other compromising procedure, particularly when it is small. This undoubtedly has contributed to the history of multiple recurrences so frequently encountered in this disease.

The proper treatment consists of mucosa reflection and total excision of the tumor-bearing region. This may necessitate the sacrifice of one or more teeth, but this is a minor loss in comparison to removal of half of the mandible in instances where the tumor destroys a major portion of the mandible after multiple recurrences. In those instances of removal of part or half of the mandible, restoration of facial contour and partial function can be accomplished by bone graft or prosthesis. Radiation therapy is of no value in the management of this radio-resistant tumor.

A 61 year old white woman was admitted to the Ohio State University Medical Center with a history of growth on the right side of the mandible for 18 years. She had avoided treatment because she believed her affliction to be incurable. Because of her monstrous appearance, she had withdrawn from society. Her speech had become unintelligible because of the extreme lingual and palatal displacement. Inanition had become pronounced since mastication was no longer effective and deglutition was most difficult. Liquids were regurgitated through the nose, and only semisolid foods could be taken in small quantities. Ulceration and infection had been present for many years, but massive hemorrhage finally forced her to seek hospitalization and treatment.

Examination disclosed a thin, pale, elderly white woman with a massive tumor of the right side of the mandible. It measured 22 cm. in its greatest diameter and moved with the mandible. The surface was ulcerated in many areas from which a foul smelling, purulent material drained. The buccal cavity and right pharyngeal wall were displaced to the left. The soft palate was so displaced as to be ineffective in separating the oral pharynx from the nasal pharynx during deglutition. The mucosal surface of the tumor was likewise ulcerated and draining. The red blood count was 1,200,000; the hemoglobin was 4.1 Gm.; the white blood count was 9,300. Roentgenograms of the mandible disclosed that there was destruction of the right half extending across the midline to the cuspid region on the left, and that there were irregularly placed osseous fragments in the tumor mass. There was also destruction of the lateral wall of the maxillary sinus, with outward displacement due to pressure from the expanding mandibular tumor.

After the patient received a high protein diet with vitamin supplement and 2,500 ml. of whole blood in preoperative preparation, the right side of the mandible, including the tumor, was resected after preliminary tracheostomy and ligation of the right external carotid artery. The

patient received 2,000 ml. of whole blood during the operative procedure. The diagnosis of adamantinoma was confirmed by microscopic examination.

Postoperatively the patient was maintained on feedings by means of nasogastric tube. Her wound healed by first intention without complications. She gained 19 pounds in the first postoperative month, and was able to take a normal diet. Her speech was intelligible, and she again became socially active and gainfully employed.

▼ Anesthesia and analgesia

Systemic toxic reactions to local anesthetics

Daniel C. Moore and John Green. *California Med.* 85:70-74 Aug. 1956

The topical use of anesthetic agents involves an element of risk. Systemic toxic reactions are rare, but they do occur and may result in death.

Topical application of a local anesthetic agent to the mucous membrane of the respiratory tract does not result in slow absorption of the local anesthetic drug and permits little dilution and detoxification of the drug before it perfuses the heart and brain.

The physical status of the patient is important: a patient who is aged, asthmatic, undernourished or exhausted tolerates less local anesthetic drug than does a patient of good physical status. The patient should have nothing by mouth for from six to eight hours prior to anesthetization. The least amount of topical anesthetic agent that will supply the required anesthesia should be employed.

A systemic toxic reaction to a local anesthetic drug usually starts with the patient's complaining of a faint, giddy feeling or the sensation of "blacking out." His speech becomes incoherent and irrational, and unconsciousness and apnea ensue. Twitching of the fingers may follow; this often develops rapidly into generalized convulsions. Vomiting, with or without aspiration, may occur. Untreated, the patient may convulse two or three more times, get progressively worse and die.

The practitioner using local anesthetic drugs should have a well thought-out and orderly step-by-step routine of treating toxic reactions to local anesthetic drugs.

Time is of the essence, and therapy must be instituted immediately at the first sign of a reaction. A few simple measures will usually control the reaction and bring about uneventful recovery. The aim is to protect the patient from hypoxia or anoxia, hypotension and cardiac failure until the anesthetic agent is detoxified.

Oxygen should be given by bag and mask immediately. While respiration is being assisted, an assistant should start an intravenous infusion of 5 per cent dextrose in distilled water.

If, after one or two general convulsions, it appears that adequate oxygenation of the patient does not prevent further convulsions, then thiopental sodium (0.6 per cent drip or 2.5 per cent solution) should be given intravenously, sparingly, to control the convulsions. Doses of 50 to 100 mg. will probably suffice. Analeptics should not be given, as they increase the oxygen demand of cells and may accentuate the depression which follows overstimulation.

Regional anesthesia by blocking the maxillary and mandibular nerves: the suprazygomatic method (O nadskulovych, tak nasyvaemych visotshnych putjach provodnikovogo obesbolivanija: i nishnetsheljust nogo nervov)

S. N. Weisblat. *Stomat.,Moscow* 5:28-31 Sept.-Oct. 1955

In operations on the mandible, nerve blocking is accepted universally as the method of choice for an effective regional anesthesia. In maxillary operations, however, there is less unanimity as to the procedure preferred.

In international dental literature, numerous authors (recently Matas and Braun) have reported using the infiltration method only in mandibular and maxillary interventions; others have combined infiltration with infraorbital and tuberosity blocks. Relatively few authors have at-

tempted to block the maxillary nerve at its intraoral course. If carefully performed, this procedure can affect the entire region supplied by the sphenopalatine ganglion and the infraorbital nerve.

In the Union of Soviet Socialist Republics, this method was introduced by the author in 1927.

After submucosal local anesthesia by infiltration in the region of the posterior palatine foramen, 1 cm. medial to the second molar, the needle is introduced into the foramen. The injection needle should be 4 cm. long and be mounted at a right angle to the syringe.

The injection point lies directly above the sagittal plane, and the course of the anesthetic effect runs into the palatine canal at a depth of about 4 cm. The ganglion is injected with 2 cc. of the anesthetic solution. When the bone of the anterior boundary of the pterygopalatine fossa is touched, the needle is in correct position. If the foramen is not encountered on the first puncture, the needle should be inserted again at a point a few millimeters posteriorly. The injection causes no pain.

When the palatine canal is reached, the needle is advanced upward and backward to a depth of 3 cm.

The suprazygomatic method has proved effective also when various types of malocclusions exist, but its use is contraindicated when extreme open bite is present.

Aerosol topical anesthesia for the intubation of patients with fractured mandibles

Harold F. Chase. *Anesth.&Analg.* 35:417-418 July-Aug. 1956

In preparation for blind intubation with a nasotracheal tube, topical anesthesia of the nose, pharynx, larynx and upper part of the trachea can be achieved by a procedure in which a 1 per cent solution of ephedrine is sprayed into each naris. The nares are next sprayed with a 2 per cent solution of tetracaine hydrochloride; the patient is requested to expectorate any excess solution reaching the pharynx. The patient assists by inhaling the aerosolized topical anesthetic agent.

Nisentil: its effect on attitude of patients undergoing surgery

Thomas H. Walters, Helene D. Mayer and Carl L. Johnson. *Anesth.&Analg.* 35:369-374 July-Aug. 1956

In an investigation of the effect of alphaprodine hydrochloride (Nisentil Hydrochloride) for the relief of pain and alleviation of apprehension, this narcotic was employed as the sole anesthetic agent in 199 patients undergoing various operations, including 48 instances of reduction and fixation of orthopedic fractures and 38 instances of dental surgery. In 186 instances (92.9 per cent) the desired effects were achieved and the necessary procedures were accomplished with a minimum of resistance and pain on the part of the patient. In 13 instances (6.5 per cent) the analgesic and sedative action was less than satisfactory. No allergic or toxic manifestations were observed.

Alphaprodine may be administered either intramuscularly or intravenously, the principal determinant being the rapidity of action desired. Repeated doses may be given to maintain its analgesic and sedative effects. Alphaprodine is an effective sedative for the apprehensive or the uncooperative patient. As an analgesic it may be employed alone preoperatively, or alone or in conjunction with other anesthetics in surgery or painful examinations. Its ease of administration, prompt action and brief duration make it a flexible adjunct to surgical and other procedures.

In recommended doses alphaprodine may be administered safely without the side reactions usually encountered with narcotics.

Paediatric anesthesia

Albert Davis. *Brit.M.J.* No. 4983:45 July 7, 1956

Many anesthetists are too complacent about the general routine of anesthesia in young children. The methods used in anesthetizing children for the removal of teeth and of tonsils differ little from those in use 25 years ago. The technic in the instances observed by the author consists, first, in trying to persuade an apprehensive patient to

inhale gas either through a nosepiece or a mask with such admonitions as "Blow it away" or "Blow the bag up," "Breathe in and you will go to sleep," and so forth, and ends by the terrified patient being held down forcibly by all available hands until he is finally unconscious. The procedure is punctuated throughout by the patient's slowly diminishing but increasingly pathetic appeals to be allowed to breathe. The progress of modern anesthesia has not eliminated such barbarism.

The view of some anesthetists seems to be that "Sometimes, of course, you have to hold them down to get them under, but it is all over in a few minutes and they soon forget all about it." This combination of physical restraint and psychological ignorance reveals a most unsatisfactory state of affairs. It is not beyond the capacity of modern anesthetic research to devise a humane method of narcosis for children.

▼ Surgical technics

Lithiasis of the salivary glands

(Litiasis de las glandulas salivares)

Pedro Ruiz de Temiño Alvarez.
Odontoiatria, Madrid 13: no. 3:129-144, 1956

In many instances of salivary lithiasis the diagnosis has been arrived at only after the patient has suffered for many years and after several operations. The treatment of this disease is usually intrabuccal, a region with which the dentist is most familiar.

Lithiasis does not occur frequently, but it is well to remember that in many instances the calculus has been expelled spontaneously and has not required medical treatment.

It is more frequent in the submaxillary gland, especially on the right side, usually when the patient is more than 30 years of age. The size of the calculi varied between 2 and 20 mm. in 36 patients examined.

The etiology is not clear, though several theories have been offered.

When the calculus totally obstructs the salivary duct, the symptoms appear suddenly. These are pain, and swelling that usually is visible both inside and outside the mouth. This happens at mealtimes, or may be caused by the sight of food, especially acid foods. Between meals the gland slowly empties and all symptoms subside.

If the calculi are intraglandular, the symptomatology is subacute, and usually there is slight suppuration through the duct.

Inspection and palpation confirm the diagnosis, and permit the operator to localize the calculus.

A silver catheter sometimes adds further confirmation. Roentgenographic examination should always be made, although a negative roentgenogram is not conclusive as not all calculi are radiopaque. Roentgenograms must be taken from several angles to avoid mistaking calculus in the submaxillary duct for an impacted lower third molar. Both occlusal and lateral pictures must be obtained.

Treatment is principally surgical, and the technic varies according to the gland affected, and whether the calculus is intraglandular or in the duct. In some instances, however, the obstruction can be eliminated by dilatation of the duct with catheters.

The possibility of multiple calculi must always be remembered, because in some extreme instances the extirpation of a gland is required.

The treatment of tic douloureux

Douglas Miller. *M. J. Australia* 43(1):11-12 Jan. 7, 1956

In any discussion of *tic douloureux* it is necessary to define the terms used. Much confusion is caused by people misnaming conditions *tic douloureux* and claiming cures and successes which are spurious, the treatment being ineffectual when applied to the real disability. If any pain is to be diagnosed as *tic douloureux,* it must be limited strictly to the trigeminal zone, be on one side only, be spasmodic and inveterate, and be characterized by areas of initiation best called "trigger zones."

Trigeminal neuralgia rarely occurs in the young and should be suspected of being organic. In

planning treatment for *tic douloureux,* it must be borne in mind that the pain is overwhelming, probably the worst pain known to human experience, that it is inveterate, that it never resolves for long or undergoes permanent natural cure, and that it occurs usually in the aged. These dominating facts must guide rational treatment. No practitioner is justified in prescribing totally useless nerve sedatives or in buoying up the unfortunate patient with groundless hopes of natural cure. That is an unintentional cruelty too often practiced.

Until the development of modern surgical treatment, no relief or hope could be offered to these unhappy sufferers. The appalling nature of the complaint was known back through the ages, and in the ancient cathedral of Wells the images of sufferers carved in stone may be recognized.

Until recently, surgical treatment was based entirely on the chemical destruction or physical division of the nerve. At present there is some reason to hope that decompression of the nerve root may be effective. A properly made injection into the preoperculum of the sensory root, and proximal to the ganglionic cells, will be effective and lasting. The alcohol destroys the fibers, and retrograde degeneration of the sensory tract occurs in the medulla. There are two operative approaches to the sensory root. The temporal route, as perfected by Frazier, carries a minimum risk to life and minimum risk of morbidity. In the author's personal series of about 200 cases, there has been no operative mortality, though one patient died some weeks later from a deep abscess.

A suboccipital approach was introduced by Dandy and has some technical advantages; it has disadvantages, however, in that it is intradural, necessitates cerebellar retraction, does not eliminate risks to the facial nerve or the eye, and carries a higher mortality rate. It is now generally reserved for instances in which for some reason the temporal route is impracticable.

Some years ago Taarnhøj of Copenhagen described an operation which avoids division of the nerve and seeks to bring about cure by decompressing and freeing the nerve root as it crosses the apex of the petrous bone. If this operation stands the test of time, it will be the ideal treatment, but any claims made now would be extravagant.

The operative measure bearing the name of Sjoquist consists of tractotomy of the descending tract of the fifth nerve at the level of the calamus scriptorius. This ingenious operation, for which there were great hopes, has too many disadvantages and risks and has not stood the test of time.

It seems at the moment that the one safe and certain cure is destruction of the nerve by alcohol or division by the Frazier operation.

Oroantral fistula: a one-stage closure

Wayman B. Norman. *Texas J.Med.* 52:472-474 July 1956

There are nondental and dental reasons for the occurrence of oroantral fistulas. Nondental causes include gunshot wounds, neoplasms and poorly performed Caldwell-Luc operations.

The dental causes are more numerous. Since the root apexes of the second bicuspid and first two molar teeth may lie close to the floor of the antrum, a piece of antral floor easily may be removed coincident with extraction of these teeth. An apical abscess at the root of a maxillary tooth may destroy the thin bone of the sinus floor and pave the way for a fistula formation. All good dentists are wary of boring or drilling for a broken root of a maxillary tooth because this is probably the most frequent cause of fistulas.

The alert dentist usually recognizes the maxillary accident immediately and sends the patient to an otolaryngologist; however, the diagnosis in acute instances is made sometimes only when the patient develops severe symptoms of acute sinusitis. The chronic fistula manifests itself by the presence of a foul taste in the mouth and a foul nasal discharge. Occasionally a patient states that fluids run out of his nose when he attempts to drink. The final diagnosis of a fistula can be made only when fluid is seen to traverse the barrier of the sinus floor.

Close cooperation between the otolaryngologist and the dentist usually results in proper treatment of the common acute and chronic fistula arising from a dental cause.

A one-stage technic is described which combines the Caldwell-Luc and the Berger closure technics. Anesthesia is best accomplished by a

second division procaine hydrochloride block, canine fossa procaine hydrochloride infiltration, and tetracaine hydrochloride or cocaine packs in the inferior meatus. The incision is new in that it is a long Caldwell-Luc incision that extends inferiorly into the affected alveolar space as in the Berger technic. The flap, larger than usual, is elevated over the canine fossa, and a thorough Caldwell-Luc procedure is performed as usual. The large buccal flap is mobilized by using the Berger technic of incising the periosteum of the flap parallel to the sinus floor. The periosteal incision, made from within outward and opened by linear tension on the flap, allows the operator almost unlimited mobilization of the flap. The affected tooth socket is cleaned of all granulations and the clean, trimmed edges of the flap and palate are approximated. Tension on the sutures is unnecessary. Prophylactic antibiotics and strong admonitions against nose blowing are mandatory.

The method has been used successfully on eight patients, each of whom complained of an oroantral fistula of six months' duration or longer.

Miscellaneous

Dental and oral surgical interventions during pregnancy (Der zahnärztlich-chirurgische Eingriff während der Schwangerschaft)

K. Kristen and P. Stoll. *Zahnärztl.Welt & Reform* 11/57:131-132 June 10; 155-158 June 25 and 185-186 July 10, 1956

Among the complications caused or influenced by dental or oral surgical interventions during pregnancy, miscarriage and premature birth are the most feared ones.

Miscarriage (abortion) is the termination of pregnancy before the viability of the fetus has been attained, that is, before the twenty-eighth week. Premature birth is the expulsion of the fetus after the sixth month of pregnancy, but before the normal full term.

According to medical statistics, interruption of pregnancy occurs most frequently during the third month.

An absolute indication for a dental and oral surgical intervention during pregnancy exists only if a painful condition disturbs the state of general health and the ability to sleep, but only after it has been established that conservative treatment will not be successful.

The following conditions require dental or oral surgical intervention: (1) acute inflammation in the oral cavity leading to abscess formation; (2) pulpitis or gangrene of teeth which cannot be preserved, and (3) necrosis which interrupts the blood and fluid circulation.

Dental or oral surgical intervention may be required if conservative elimination of acute symptoms (for instance, after opening of abscesses), and gynecologic and general examinations have established that the pregnant patient can endure a complicated tooth extraction or a root resection.

At the Dental Clinic and Polyclinic of the University of Heidelberg, Germany, the following operations have been performed without unfavorable consequences for the pregnant patients: extraction of cuspids and third molars, and cystectomy and partial root resection necessitated by the presence of adamantinoma. Oral surgery was performed under local anesthesia with procaine hydrochloride and epinephrine. The use of procaine hydrochloride combined with nordefrin hydrochloride was contraindicated because during pregnancy the thyroid gland is enlarged and hypersensitive. In all instances, the course of healing and cicatrization was uneventful. In women pregnant about four months, the blood coagulation period is prolonged and such patients must be watched carefully for secondary hemorrhages.

Gingivitis and stomatitis in pregnant patients often lead to postoperative hemorrhages. It is advised that patients with these conditions should bite on a sterilized cotton plug for from 20 to 30 minutes after tooth extraction.

If the patient's past history does not reveal any abortion, routine dental or oral surgical procedures can be performed after the third month of pregnancy, but before this time even the simplest intervention should be avoided. This holds true for abnormal and prolonged pregnancy.

Basic science

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Anatomy

Investigations of denture supporting bone surfaces of the mandible

(Untersuchungen der knöchernen Prothesenauflagefläche im Unterkiefer nebst praktischen Folgerungen)

Anton Hromatka. *Stoma* 9:106-114 and 144-163 May and Aug. 1956

At the Anatomic Institute of the University of Innsbruck, Austria, 1,839 mandibles from the skulls of infants, children and adults of both sexes were examined to determine the condition of bone surfaces which support dentures. All these skulls came from inhabitants of the northern Alpine region.

In series of 100 mandibles each, the following parts were studied: (1) the mylohyoid line with the submaxillary fossa; (2) the retromylohyoidal region; (3) the sublingual fossa; (4) the mandibular torus which seldom is found in other Europeans; (5) the retromolar triangle with the medial crus; (6) the alveolar plane, and (7) the mental foramen.

The mylohyoid line was studied with regard to its length and the degree of development. Laterally, the mylohyoid and the oblique lines form the boundaries of the central part of the mandible in which atrophy most frequently occurs. This atrophy, appearing usually after loss of all teeth, especially if no artificial denture is inserted, often is called "senile" atrophy. It is, however, not the age of the patient but the loss of function which causes this physiologic diminution.

The resorption on the mesial alveolar wall toward which the teeth move is not a continual process. This resorption occurs in waves, each of which is followed by a period of repair.

In the retromandibular region, the various degrees of inclination of the plane have no relation to the different degrees of development of the mylohyoid line. When a smaller angle of inclina-

Figure 1 Above: Submaxillary fossa, conical protuberances below the denture base. Center: Mandibular torus. Below: Mandibular torus and proper denture base

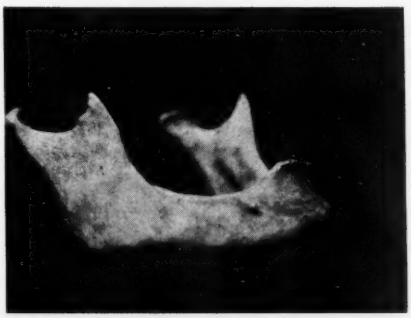

Figure 2 Above: Retromolar triangle. 1=lateral crus; 2=medial crus. Center: Anterior crest with labially extended edges. Below: Sharp-edged bony crest

tion is present, however, the possibility of the denture not fitting exists because the fit then depends more on the condition of soft tissues than on that of the bone surfaces.

The sublingual fossa, developed in about 80 per cent of infants but in only 14 per cent of adults, has no relation to the condition of the denture supporting bone surfaces of the mandible.

The symmetrical exostoses on the inner part of the mandible are designated as mandibular tori. These exostoses show smooth protuberances or rounded (curved) edges. This phenomenon appears in 12 per cent of the mandibles but only in 1 per cent when the jaws are completely developed. In Asiatic races, especially of the Mongoloid type, a pronounced mandibular torus occurs more frequently.

For prosthetic rehabilitation, these protuberances are important because they provide adequate support for the denture.

The retromolar triangle is found only in mandibles which still contain all teeth. The medial crus is bilateral in about 9 per cent of instances and appears as a sharp-edged bony crest.

In edentulous mouths, the bone surface of the masticatory apparatus is called "alveolar plane." In 20 per cent of instances, the sharp-edged bony crest remains and causes difficulties in the construction of properly fitting dentures.

The mental foramen lies on the upper bone surface of the mandible in 20 per cent of instances in which severe resorption had occurred, and in 10 per cent on its edge. This condition, however, seldom causes difficulties in the construction of dentures.

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Histology

Mast cells in human gingiva (Sobre los mastzellen de la encía humana)

A. Stella. *An.Fac.Odont.Montevideo* 2:125-138 Second Semester 1955

Biopsy was made of gingiva that was clinically normal and of gingiva with pathologic tissue changes of varying degrees to study the mast cells. The toluidine blue stain which was used for the metachromasia of the granulations stained them red violet. The para-aminosalicylic acid reaction (McManus), which was used for the histochemical study of the granulations, gave positive results.

The gingival corium is rich in polymorphous mast cells which are mostly grouped around the blood capillaries. The number of mast cells is greater and their polymorphism more pronounced in the corium of inflamed gingiva than in the corium of clinically normal gingiva. The number and size of the granulations change during the course of several gradual processes by which the granulations set free from the cytoplasm and disperse into the connective gingival tissue with total disappearance of the cell nucleus and of the cytoplasm in some instances. The picture of mast cells in the stage of degranulation in the human gingival tissue resembles that of experimental degranulation of the mast cells under the local or general action of cortisone as it has been reported in the literature. This picture was observed only in pregnant women with gingivitis; in these instances amitotic division of the mast cells was observed.

The pronounced polymorphism of the mast cells in the gingival corium seems to be caused by endogenous and exogenous stimuli on the mast cells that prepare the cells for an intraepithelial cycle of development. The mast cells respond to stimulation with the elongation of cytoplasmic pseudopods and with an active ameboid movement of the cell by which the complete cell with its nucleus follows the pseudopod when it enters the lower layers of the epithelium. The intraepithelial cycle of the cell starts in the basal layer of the epithelium. The cell maintains its integrity for some time. Then it ascends from the lower to the middle and later to the superficial layers of the epithelium. At this level the cell disintegrates with destruction of its nucleus and of its cytoplasm and with dispersion and probably lysis of the granulations. The intraepithelial cycle of the mast cells of the human gingiva can be observed in microscopic preparations.

The mast cells of human gingiva constitute a true cytophysiologic entity because of their morphology, structural changes, histochemical properties and the probable nature of their evolution.

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Biology

Periodic phenomena in dental research (Periodische Phänomene in der Stomatologie)

Hans R. Mühlemann, Zurich. *Deut.zahnärztl.Zschr.* 11:977-983 Sept. 1, 1956

Biologic and biochemical investigations play an important part in dental research. The results obtained, if used with discrimination, may help to solve problems in differential diagnosis, and in many instances these results will be essential factors in treatment planning and prognosis.

Intensive research into rhythmic phenomena reveals the relations existing between changes in the oral structures and alterations occurring either in the whole organism or in its parts.

At the Dental Institute of the University of Zurich, Switzerland, studies of biologic processes and reactions appearing in oral structures have established evidence that these alterations occur in certain rhythms.

Examples of such rhythmic changes are as follows: (1) the monthly periodicity in gingival keratinization during the sexual cycle in women; (2) the periodicity in leukocytic infiltration of epithelial attachments in rhythms of 24 hours (as established in albino rats); (3) the mitotic periodicity in the retromolar epithelium and in the

connective tissue of the periodontal membrane, also in rhythms of 24 hours (in albino rats), and (4) the periodicity in tooth mobility in man, regulated by a 24-hour rhythm.

The establishment of a continuously changing rhythm and a 24-hour periodicity seems to be essential for unbiased interpretation and evaluation of considerable biologic data in dental research.

▼ Anthropology

Position of the mental foramen in man

(De ligging van het foramen mentale bij de mens)

A. M. M. E. Catsberg. *Tschr.tandheelk.* 63:180-193 March; 276-294 April 1956

At the Anthropobiologic Institute of the University of Amsterdam, the various positions of the mental foramen of recent man and of several fossil types of diluvial man have been investigated.

It was established that mental foramens in children of recent man are positioned below the deciduous first molars in more than 95 per cent of the skulls examined.

In recent human adults, however, the mental foramens are positioned below and between the bicuspid roots. In isolated instances, they are situated directly below the roots of the second bicuspid.

In skulls of diluvial man, the mental foramen lies nearer to the molar region, resembling the condition appearing in recent children.

The position of the mental foramen seems to have a fixed relation to the width of the angle of the jaws. In diluvial man, this angle was 90 degrees, and in modern man, it varies between 120 and 140 degrees. In instances in which mental foramens are positioned below and between both bicuspid roots, the angle of the jaw is greater than when they are situated below the root of the second bicuspid.

A decrease in total width of the lower incisors nearly always is accompanied by the following variations: (1) increase in the mandibular angle; (2) decrease in distance between mental foramen and mandibular border; (3) decrease in anterior mandibular width; (4) decrease in condylar width; (5) decrease in width of posterior mandibular dental arches in a transverse direction, and (6) decrease in length of the anterior mandibular dental arches in a sagittal direction.

The position of the mental foramen below and between the roots of first and second bicuspids is related to the dimensions of the mandibular angle. The height of the ascending ramus and the length of the mandible are increased when the mental foramen is situated below the roots of the second bicuspid as compared to instances in which the mental foramen is positioned below and between the roots of the first and second bicuspids.

The position of the mental foramen in present-day adults seems to be unchangeable and is nearly always bilateral.

In the population of the Netherlands, the mental foramen is positioned nearer to the anterior teeth than was observed in the skulls of diluvial fossil types of man.

Caries in the South Africa ape-man: some examples of undoubted pathological authenticity believed to be 800,000 years old

A. J. Clement. *Brit.D.J.* 101:4-7 July 3, 1956

The description by Robinson (1952) of two instances of caries in the teeth of one of the so-called South African ape-men (*Paranthropus crassidens*) has drawn attention to the fact that the antiquity of caries in the Hominidae (the family of mammals to which mankind belongs) is far greater than has been realized hitherto. Caries is probably older than mankind itself.

In the 240 teeth found at Swartkrans and the 120 teeth found at Sterkfontein, there were four instances of authentic caries; that is, rather more than 1 per cent. The ape-man had probably in part adopted an omnivorous diet.

The South African ape-man was brought to the attention of the scientific world with the finding in the Western Transvaal of the Taungs skull, and its subsequent description by Professor Raymond Dart in 1925. When Dart claimed that the

remains of the ape-man represented one of the missing links in the ancestry of man, his findings were disputed by most leading anthropologists. The passage of time and the finding of many further specimens has altered this outlook, and today most anthropologists favor the viewpoint that the ape-man was more closely related to man than to the anthropoid apes. Robinson states that the Telanthropus remains from Swartkrans are of the order of 800,000 years of age.

Unmistakable dental caries occurs in two teeth. In the tooth specimen SK14—a left maxillary second molar—the mesiobuccal cusp has been almost obliterated by two carious pits. The other instance of caries occurs in an upper molar in the form of two pits on the buccal face. Hypoplasia was present in both of these carious teeth. No other teeth have any trace of hypoplasia.

Most instances of caries in prehistoric man have originated either cervically or proximally; in the latter instance the caries usually has been associated with the attritional breakdown of the dental contact points and the subsequent interproximal impaction of food.

▼ Pathology

Leucoplakia buccalis and oral epithelial naevi. A clinical and histological study

B. E. D. Cooke. *Brit.J.Dermat.* 68:151-174 May 1956

Leukoplakia is a term used to designate abnormalities of keratinization of the oral mucosa resulting from friction, smoking and syphilis, and has also been used to designate developmental anomalies that will be described under epithelial nevi.

The term keratosis is preferred to leukoplakia, for unnecessary mental distress may be given to a patient if he finds in a book or dictionary that leukoplakia may be associated with syphilis or that it will probably become a cancer.

There were 13 patients in the series described in whom oral lesions were thought to have resulted from smoking. In none could the dental condition be regarded as satisfactory, and in about a third there was gross oral neglect with carious, nicotine-stained teeth encrusted with calculus. In pipe smokers the palate and tongue were affected, and in cigarette smokers, the cheeks; the appearance of the lesions varies according to the site. On the anterior half of the hard palate, a well-defined, raised white plaque or plaques were seen on the side to which the stem of the pipe was directed. The cheeks showed a diffuse, faint, even milky, whiteness of the mucosa which was maximal at the commissures and narrowed posteriorly.

Three patients had lesions on the floor of the mouth in the form of linear, raised, well-defined white patches. The tongue was affected in three patients and here the lesion was a linear, smooth, tessellated, bluish white patch that was given a depressed appearance by the adjoining papillae. The lower lip was involved in three patients and the upper in two. The lesions varied from a tessellated, bluish white patch on each side of a groove in which the cigarette rested to a well-defined, raised, thick white plaque. In one instance a raised, firm, nodular carcinoma was set on a mucosa that was extensively affected, and other irritant factors were present as evidenced by the huge masses of calculus on the lower incisor teeth.

Tissue was removed for biopsy from the cheeks of three patients. In all, the surface was well keratinized. In two the epithelium had a well-differentiated keratin layer, no acanthosis and a flat basal layer; in one there was melanin in the basal layer prickle cells and in the corium. There was a very mild lymphocytic infiltration in these two instances, both the result of cigarette smoking, but in the third, occurring in a pipe smoker, the infiltrate was dense and associated with liquefaction degeneration of the basal layer, acanthosis and multinucleated prickle cells.

The condition of the gingiva of the cigar smoker could be regarded as precancerous, for there was considerable acanthosis with long, forking epithelial ridges, parakeratosis and many mitotic figures, together with a dense plasma cell and lymphocytic infiltration of the corium.

There were 18 patients with frictional keratosis —15 men and 3 women. Those with a mild lesion

involving that part of the cheeks opposite the occlusal line of the teeth could not be singled out by occupation, but in manual workers the commissures were involved.

The leukoplakia of tertiary syphilis is now becoming a rarity; nevertheless, its pathognomonic clinical symptoms facilitate its recognition. Another group of patients manifested regions of keratosis for which no cause could be found. Two patients in this series had this lesion on the tongue. Both were nonsmokers (idiopathic keratosis).

Congenital anomalies of the mucous membrane have not received the same attention as those of the skin, as a result of the tendency to classify all white patches on the mucosa as leukoplakia. Since so few instances of epithelial nevi of the oral mucosa have been reported in the literature, six further ones are described.

The most important condition to consider in the differential diagnosis of leukoplakia is lichen planus. It is possible that the atrophic form of lichen planus, when accompanied by shallow erosions on the tongue, may be mistaken for leukoplakia undergoing desquamation, but in lichen planus the characteristic pearly white papules would be seen elsewhere in the mouth.

Problems and obligations in the treatment of cancer

Editorial. W. H. Cole. *Surgery* 39:889-891 May 1956

Although cancer does not rank first among the various diseases as a cause of death, being second to heart disease, it is nevertheless the cause of more confusion and misunderstanding than any other disease. Part of this confusion arises from the fact that the vagaries and inconsistencies of cancer are so profound. This unfortunate circumstance makes it necessary to continue the attack against the disease with the best scientific and philosophical means.

The ultimate result in cancer, as expressed in five year and ten year survival, has improved during the past few decades, but during the past few years not much improvement can be claimed. Part of the improvement during the past few decades has been due to more radical operative procedures for the disease. Little advance in the future can be expected from this standpoint, since operations are now so radical that extension is scarcely possible anatomically. More thought should be given to preventive measures such as minimizing the spread of cancer during operative therapy.

There appears to be little doubt that an unsuccessful attempt to remove a tumor will disseminate the tumor and shorten the life of the patient. To minimize the development of this unfortunate deleterious effect, efforts to detect inoperability should be made before the operation is started. In certain tumors the five year survival rate is too low to justify a radical operative procedure with a high mortality rate.

Results in the majority of types of cancer after radical resection or radiation therapy are so favorable that patients can receive an optimistic answer to their questions concerning prognosis, provided invasion has not extended beyond the line of resection.

When the patient is seen too late to expect surgical or radiation therapy to be effective, resort must be had to the palliative measures and psychological mechanisms. One of these psychological mechanisms too seldom used relates to the spontaneous regression of cancer. Although spontaneous cure of cancer is extremely uncommon, spontaneous regression is less rare and has been noted by practically all physicians. Furthermore, delay in development of metastases and slow growth of metastases is extremely common. If the patient is told that tumors sometimes stop growing and even disappear, this phase of cancer inactivity can be utilized in allaying the patient's fear even after metastases have been recognized by the patient as evidence of recurrence.

More effort should be made to correlate these examples of regression or slow growth of the tumor in cancer research. The cause of this regression or slow growth is unknown, but each would appear to be related to an immunity factor in the patient's body. There is fairly good evidence that the body can elaborate specific antibodies against cancer. In certain patients with cancer an elevation of globulin and fibrinogen is encountered, but the level decreases as the malignant invasion becomes more extensive. Antigens

have been extracted from tumor tissue in efforts to develop tests for cancer, but as yet none of these tests is reliable. Recently, antibodies have been found in certain patients with early cancer but not in patients with advanced cancer. This observation suggests that antibodies may be an important influence in growth or destruction of cancer. At any rate this immunological phase of cancer research appears to be about as important as chemotherapy from the standpoint of cancer research. Both in time should yield significant results.

Recent advances in oral cancer

Harold H. Sage. *New York J.D.* 26:263-268 Aug.-Sept. 1956

Oral cancer represents about 4 per cent of all human cancer in the United States; in certain parts of the world, such as in Bombay, 30 to 35 per cent of all cancer is oral. In the United States 80 to 90 per cent of oral cancer occurs in men, but in Sweden there is a much higher incidence in women.

Smoking, chemical and physical irritation, bad mouth and teeth hygiene, chronic infections and irritant discharges in the mouth contribute to produce oral cancer. Excessive sunlight is an important factor in the causation of cancer of the lower lip. Chronic repeated irritation of the mucous membrane results in destruction, atrophy, repair and eventual epithelial hyperplasia; these are the processes which commonly precede oral cancer.

The development of cancer in leukoplakia makes recognition, observation and treatment of such white patches on the mucous membrane important. In about 10 per cent of instances of oral cancer, the disease may arise in more than one region. The term "precancer" is justified for epithelial lesions such as leukoplakia since under the usual conditions a significant number may become malignant although not invariably.

Connective tissue hyperplasias and benign connective tissue tumors are common in the mouth; however, they rarely become malignant.

A thorough examination of all parts of the mouth should be done in every good dental examination. The use of two wooden tongue depressors or metal tongue blades facilitates the examination. Good lighting should be available. Palpation should always be included, and the base of the tongue, palate and tonsillar regions should be examined.

The dentist shares a great part of the responsibility for recognizing mouth cancer since about half of the patients consult a dentist first. A high index of suspicion is important towards all chronic, ulcerative, nonhealing lesions in the mouth and obvious growths. Watchful waiting or symptomatic treatment is a poor policy, particularly in older people. A common mistake is to remove diseased or loose teeth without identifying possible malignant change in the underlying tissues.

Biopsy should be done without delay in most instances. There are considerable differences in the signs and symptoms produced in cancers of different sites of the oral cavity. Cancer of the anterior part of the mouth may ulcerate early or become traumatic and inflamed, producing pain or bleeding. This region is also better adapted than the posterior part of the mouth to self-examination and recognition of cancer by the patient as well as by the dentist or physician. Cancer of the base of the tongue and tonsil may grow fairly large without any sign or symptom at all. The first sign in 40 per cent of the instances may be enlarged, painless, metastatic lymph nodes in the neck.

Because of the high percentage of instances of oral cancer which metastasize to lymph nodes in the neck, such metastases must be searched for diligently. Radical neck dissection is the accepted method of treatment for instances of advanced oral cancer with metastasis to the neck nodes.

The importance of leukoplakia in oral cancer

Jesshill Love. *J.Kentucky D.A.* 8:6-8 July 1956

The dentist in general practice has an excellent opportunity to discover the small and early changes in the mucosa of the mouth that are early forms of cancer or that may lead to a malignancy.

When a patient is seen with a keratosis of the lip or a leukoplakia in the buccal area, the patient should be informed of the need to have the lesion removed.

Keratotic scales and plaques of the vermilion border of the lips and leukoplakia of the oral mucosa are essentially the same lesions. On the lips they are dry, thickened and often have curled edges. In the mouth they are whitish and soft because of the secretions. Both are associated consistently with cancer. The usual story of cancer of the lip covers a period of nine months of admitted duration.

All leukoplakia and keratotic changes must be recognized as precancerous, and the lesions must be eradicated surgically. Although some leukoplakia may not produce cancer, if all are removed none will have the chance to become neoplastic. Dentists must seek and find the causal agent and insist that it be removed or eliminated. Smoking, chewing or snuff dipping are the most common factors. Repeated sunburn of the lower lip may produce precancerous lesions.

A rare anomaly—triple dental fusion

(Uma anomalia rara—triplice fusao dentaria)

Lelio Marques. *J. estomat.,Lisbon* 3:13-14 Feb.-March 1956

Fusion is an anomaly wherein two dental germs, originally separated, come into contact and become fused. An unusual case involving three fused teeth is reported.

If the crowns are fused, as in the instance reported, it means that the fusion took place early in the development of the teeth. If the fusion took place late, then only the roots will be fused. Fusion is an anomaly that occurs both in deciduous and permanent teeth, and also in supernumerary teeth.

The patient, an eight year old boy, manifested a fusion of three lower deciduous teeth, the two left incisors and the right central incisor.

A roentgenogram showed roots almost totally absorbed. The extracted specimen measured 8 mm. along the incisal edge, and 10 mm. high, of which 3 mm. corresponded to the length of the crowns.

Both on the labial and lingual surfaces there were two vertical grooves, quite evident but not deep. The three portions thus limited represented each of the three fused deciduous teeth. Observation with a magnifying glass revealed no interruption in the enamel. Each tooth had its own well-formed nerve canal.

Stress as an etiologic factor in the development of cleft palate

Lyon P. Strean and Lyndon A. Peer. *Plast.&Reconstr.Surg.* 18:1-8 July 1956

Two hundred and twenty-eight mothers of children with cleft palate or cleft lip were questioned at the rehabilitation center of the Hospital of Saint Barnabas, Newark, N. J., to determine whether any relationship existed between their medical history (particularly in the first trimester of pregnancy) and the incidence of these congenital abnormalities. Since the maxillae in the human embryo fuse between the sixtieth and seventieth day of pregnancy, information relating to the eighth, ninth and tenth week of pregnancy was critical to the study.

The information gathered from the replies to the questionnaire indicates that cleft palate and cleft lip are more prevalent in white children than in colored. The age of parents does not play a significant role in the development of cleft palate in the offspring, as this congenital abnormality was not limited to children born of older or younger parents. Since the incidence of cleft palate was highest in the firstborn, and many mothers were fearful of a second pregnancy, the average age of the mothers at the time of pregnancy was relatively low. The high incidence of cleft palate in the firstborn may be attributed to the severe anxiety frequently associated with the first pregnancy, coupled with other stressful situations.

Physiologic stress resulting from infectious and other forms of disease and traumatic stress occurring between the eighth and eleventh week of pregnancy constitute significant causative factors.

Severe emotional stress, particularly when associated with hyperemesis, appears to have been the most important single factor.

Eighty-five per cent of the mothers said they did not have similar disturbances during the first three months of pregnancy with other children. There may be a threshold of stress tolerance below which normal children result.

In this group of 228 mothers and 232 children, there were four sets of twins of which two sets were believed to be homozygous; only one child in each of the four sets had cleft palate. Only four mothers had more than one child with cleft palate, and in no instance were there more than two children so afflicted.

Twenty-five per cent of the mothers stated that some member in the family tree had a cleft palate or cleft lip.

It is possible that the catabolic effect of the production by the gravid mothers of an abundance of hydrocortisone secreted by the adrenal cortex in response to stress may be an important factor in producing this congenital abnormality. An excess of this hormone inhibits fibroplastic proliferation and produces histochemical changes in collagen fibers.

Halitosis: a review

Lister L. de Sousa. *J.All India D.A.* 28:107-116 June 1956

Although people have been conscious of halitosis for at least 3,500 years, its study was not undertaken seriously until some 15 years ago.

Offensive breath may be caused by the following: dental conditions, especially food stagnation around the teeth; diseases of the oral soft tissues; diseases of the nasopharyngeal region; diseases of the digestive tract (the popular belief that bad odors emanate from the stomach is unfounded); diseases of the lungs; metabolic and general diseases; the ingestion of drugs and poisons; the ingestion of foodstuffs, and physiologic conditions.

Fair and Wells designed (1934) a simple instrument, the cyroscope, to measure odor intensities. Miscellaneous factors affecting odor intensities of the mouth include age, time after meals, caries, periodontal diseases and sex.

The dentist should seek to discover the cause(s) of malodors in the patient's mouth; if necessary, the patient should be asked in his own interest to have a physical examination. The dentist should seek to remove the predisposing cause and to advise oral hygiene. The maintenance of a healthy mouth is largely the responsibility of the patient, and calls for his unstinted cooperation.

Although some people may regard halitosis as of no great significance, it may warn of impending danger or show a disregard of oral hygiene. Halitosis can be a social handicap. The dentist is one of the privileged few who can offer advice in such instances, with authority and with no embarrassment.

▼ Psychology

Personality and disease: the role of emotional factors (Persönlichkeitsstruktur und Erkrankung: Die Rolle emotionaler Faktoren im Krankheisgeschehen)

Hans Joachim Baltrusch. *Klin.Wschr.* 34:69-75 Jan. 1956

At the Department of Internal Medicine of the Evangelic Hospital of Oldenburg, Germany, psychodynamic investigations were undertaken to determine the role played by emotional factors in the pathogenesis and the course of disease. These investigations consisted of analytic personality interviews of 65 patients and of projective tests.

The patients were divided into two groups: (1) those with functional disorders and (2) those with organic diseases. In both groups a significant and constant relation between emotional conditions and physiologic disturbances was observed. During the personality interviews, nearly all patients revealed they had been exposed to emotional stress before onset of the disease. The disease then had been accompanied by an increase of stress and emotional maladjustments. In many patients, emotional tensions and conflicts lasted for a long period.

Reaction to stress in a neurotic manner depends on factors involving the development of the personality and of the reaction patterns. Decisive for

the individual mental development were parental attitudes and the patient's experience during the first six years of life. In patients with functional disorders, the subsequences of parental dominance or rejection, of early pampering or overprotecting, were observable. This form of parental attitude led to an unnatural increase of obedience, submissiveness and dependency. About 40 per cent of parents of patients in the group with functional disorders also showed signs of emotional insecurity. Three kinds of causes for physiologic disturbances were observed: (1) inhibition; (2) suppression of aggressiveness and (3) self-assertive behavior.

A conflict of autonomy versus dependency and pseudocompliance was observed in many patients. Neurotic fear and anxiety were evident in most functional disorders. There was a higher degree of early neurotic traits noticeable in the group with organic diseases, paralleled by a high frequency of mental depression and obsession.

Physicians and dentists should observe their patients from a psychologic point of view because many pathologic conditions are associated with depressive or obsessional phenomena causing (or caused by) physiologic changes in the human organism. Although psychotherapy often influences the course of organic disease, the problem of readjustment is important for every healing process. Frequently, the severity of the underlying neurosis determines whether the somatic conflict will become chronic. The role of emotional factors should be considered in medical and dental diagnosis, treatment planning and prognosis.

Alleviation of pain in dental treatment
(Zur Frage der schmerzarmen Behandlung)

Georg Mravlag. *Österr.Zschr.Stomat.* 53:305-307 June 1956

It is a unique sign of the times that apprehension of pain is more feared than pain itself. Today, it is rare that a tooth is extracted without the patient requesting anesthesia. The many new anesthetics prove the actuality of this observation.

Psychic factors, in dentists and patients, play a significant part in present-day dental practice. Another step toward complete alleviation of pain (in many countries this step has already been taken), hypnosis in dental practice, will be a matter of daily occurrence.

In present-day dental practice, however, the psychological guidance by the dentist often is more effective in the alleviation of anxiety, uneasiness and pain than are anesthetics and hypnosis. How the patient's psyche acts and reacts during injection anesthesia was established in the following tests.

In 150 patients, the same anesthetics were used in local and in conduction anesthesia. The patients were taken at random as they came to the office. Only patients in whom the presence of periodontal disease or drug allergy was suspected were excluded.

In Group I, anesthesia was applied without psychic guidance by the dentist.

In Group II, the patients were assured that a new drug or a new method would be used to enable a painless, even a pleasant, tooth extraction.

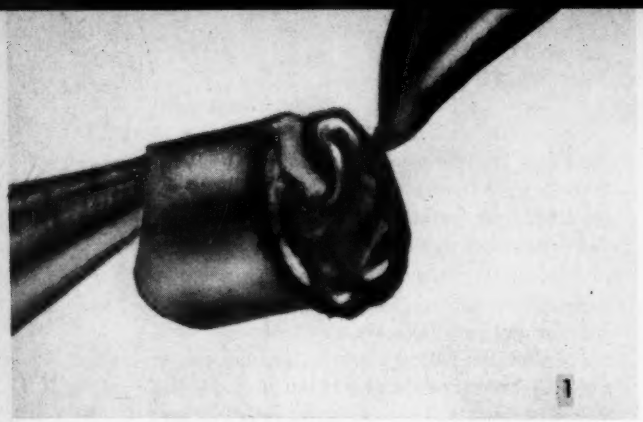
In Group III, the patients were instructed to report immediately if the anesthetic effects were not adequate.

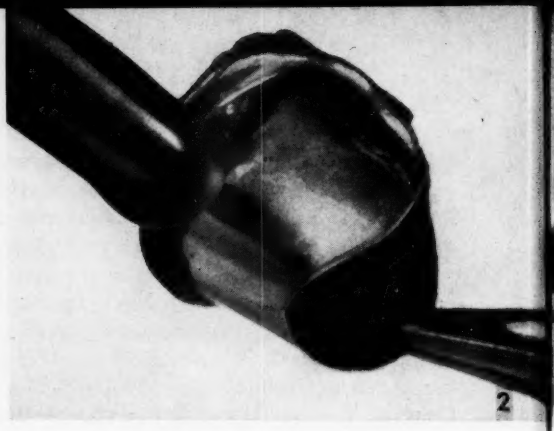
Feelings of pain were claimed by 50 per cent in the first group; by 1 per cent in the second group, and by 4 per cent in the third group. In the last group, an additional 6 per cent requested increase of the anesthetic effect.

The test was duplicated with child patients. Group I showed 20 per cent failures; Group II none, and Group III almost none (scarcely 1 per cent). There were no requests for an increase in the anesthetic doses.

In the alleviation of pain in dental practice, the psychic guidance by the dentist, the elimination of the patient's anxiety, and instruction determined by the degree of the patient's intelligence, are more effective than the inhaled or injected drug.

For the patient's instruction, the words of an old dental educator still are valid: "You cannot explain to the patient in five minutes what you have learned in years of training, study, experience and research. What you will tell him, how you will treat him, depends on your own ability to find the contact between the individual patient and yourself. This contact is necessary in every dentist-patient relationship, and it is essential for even the simplest dental treatment."





Operative dentistry

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Inlays and fillings

Silicone rubber as impression material for inlays

(Silikon-Gummi als Abdrucksmasse für Füllungen)

J. F. Grassl. *Zahnärztl.Praxis* 7:2-3 Aug. 15, 1956

The utilization of silicone rubber for taking impressions to make dies for indirect inlays has made possible a degree of accuracy which previously was unattainable with other impression materials. This quality of exactness was demonstrated by tests performed at the conservative department of the Dental Clinic of the University of Munich.

In these tests, inlays made on dies which were developed from silicone rubber impressions were transferred to dies made from various impressions made with other materials, in the same cavities. The degree of accuracy attained with silicone rubber has made it possible to prepare several cavities at one time, and the inlays can be inserted at the patient's next visit. Appointment and chair time were saved for both the dentist and the patient.

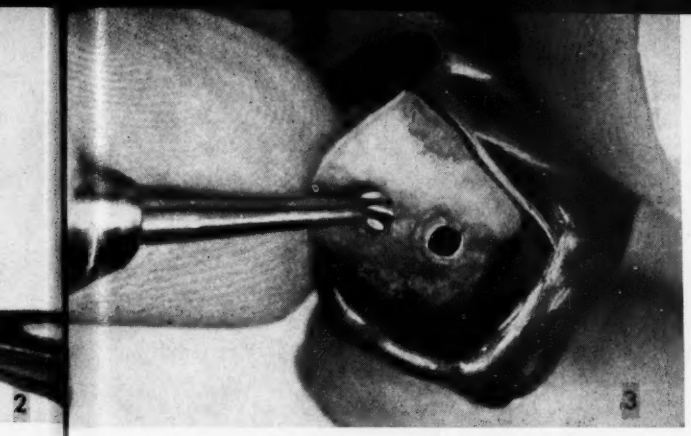
To obtain the best advantage of silicone rubber for inlays and fillings, the material should be ready for use at all times. Only a few items of equipment are necessary so that valuable time is not wasted, and the customary technic of securing a perfect impression can function smoothly.

The fact that silicone rubber in its relatively free flowing condition does not displace gingival tissue makes it obvious that the gingival tissue should be beyond the gingival margin of the preparation. The investing tissues must be dry and free from blood, serous exudate and mucin.

The carious dentin is eliminated and the necessary investments prepared. With a small, conic diamond bur, the occlusal edge of the preparation is freed of tissue. Several methods can be used to accomplish this: surgical, cauterant, mechanical and chemical. The use of strong caustic solutions, however, is contraindicated.

The accuracy of reproduction of silicone rubber impressions, combined with stone dies and models, makes it possible to duplicate well adapted direct patterns indirectly at the laboratory bench. Many of the difficulties frequently encountered in direct pattern making in the patient's mouth are eliminated.

In addition to accuracy, a great saving of time and energy is achieved, because from one silicate rubber impression, without the necessity of additional visits of patients, it is possible to construct: (1) simple inlays or crowns; (2) multiple inlays or crowns; (3) crowns used as attachments for fixed bridges; (4) crowns used as attachments for partial dentures; (5) any combination of the



1. Preparation of the inlay ring and cover. 2. Metal separator in position preparatory to vibrating the die stone into position. 3. Drilling of from one to three holes in the proximal plane of the inlay ring. 4. Separation of the cement models

forenamed with increases in vertical dimension, and (6) any combination of the forenamed with precision attachments.

There is no substitute for good cavity preparation, and the technic of silicone rubber impression will disclose the slightest errors such as undercuts or faulty margins.

With a little patience, every dentist can master this technic; if the correct principles are followed the result will be favorable.

Since no single impression material exists which can be used universally for all types of prosthetic work, the dentist must become proficient in the use of all standard impression materials so that he can plan the impression taking procedure to fit each individual instance. For inlays, especially those made of precious metal, silicone rubber is the impression material of choice.

Histologic structure of enamel in relation to cavity preparations (La estructura histológica del esmalte y su relación con preparaciones cavitarias)

J. C. Turell. *An.Fac.Odont.Montevideo* 2:159-180 Second semester 1955

A clinical and histologic study of the structure of the enamel in relation to cavity preparation was made. Microscopic sections were obtained to study the direction of the enamel prisms in the crowns of all the teeth (temporary and permanent). The study was aimed at finding what clinical procedures should be used in cavity preparation to secure structurally strong cavity walls.

In cavity preparation the resistance of the enamel wall depends on the direction followed by the prisms in the enamel and on the relation of the prisms to the dentin. The inclination of the walls is determined by the general direction of the enamel prisms in the involved zone of the cavity. The enamel should always rest on healthy dentin (with the central endings of the prisms in contact with the dentin and the external endings protected by the filling material).

The knowledge obtained from the study makes it possible to select the procedure to be used (walls of a proper inclination with or without cavity beveling) in every type of cavity. The procedures are studied in Class I cavities (occlusal surfaces of bicuspids and of molars), Class II (proximal and compound cavities of proximal surfaces of bicuspids and molars), Class III (cavities in the proximal surfaces of the anterior teeth without involvement of the incisal angle), Class IV (in which either "slices" or cavities of the Class III type are prepared) and Class V (cavities in the cervical zones of the labial and lingual surfaces of the teeth).

The indications for cavity beveling are related to several factors; mainly, the material used for the filling, the inclination of the walls, the more or less pronounced protection demanded by a wall, stress of mastication, the location of the cavity, and so forth. The beveling varies in each instance. No general rules can be set forth for

its indication and degree of angulation. It is not advisable to make bevels that are less than one half the entire thickness of the enamel. Hard gold is the only filling material which can be used when the beveling involves only half the entire thickness of the enamel. When soft gold or amalgams are used, it is necessary to bevel the entire thickness of the enamel. Even in this instance, it is advisable to use a gold filling of great hardness. The knowledge of the histologic structure of enamel obtained from the study of sections secured by grinding of the teeth and the clinical experience constitute sound basis for determining (1) the correct inclination to be given to the enamel walls for strength of the walls and (2) the indications, contraindications and degree of beveling in the various zones involved in cavity preparation.

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Miscellaneous

Effective cavity lining

W. L. Carter and John M. Stinnett. *J.Oklahoma D.A.* 45:22-25 July 1956

A cavity liner that provides the most adequate protection for the pulp is composed of the following ingredients: chloroform, 1 ounce; colorless polystyrene, 25 to 30 pellets; calcium hydroxide, about 6 Gm.; zinc oxide, about 6 Gm., and several crystals of thymol.

The chloroform, polystyrene and thymol are placed in a small bottle which is closed and the polystyrene and thymol are allowed to dissolve. The bottle is shaken, calcium hydroxide is added, and the mixture is agitated for a few minutes. Half a portion of the zinc oxide is added and the mixture is agitated. Small amounts of zinc oxide are added, and the mixture is agitated until a consistency of heavy cream is obtained. If the mixture becomes too thick, more chloroform is added.

The liner may be applied with a burnisher, cotton pellets or a brush, but the most efficient method is to use a standard dental local anesthetic syringe with a 20 or 21 gauge needle. The bevel of the needle is cut off to make a blunt end, and the end third of the needle is curved to about a 100 degree angle. This is the most practical and efficient method of applying the liner.

A rubber plunger is removed from an anesthetic carpule, the carpule is cleaned and filled with the cavity liner, and the rubber plunger is replaced. The plunger is inserted in the syringe, and all air plus a small portion of the liner are ejected. If the liner will not pass through the needle, the liner should be diluted with chloroform. The tip of the needle need not be covered because the polystyrene will seal off the lumen and prevent hardening of the liner.

The liner is applied to the cavity, allowed to set for 10 to 15 seconds, and then dried with a gentle blast of warm air for from 5 to 10 seconds. The liner is now ready to receive a filling material or a secondary base.

Shallow, medium and deep cavities are treated by medicating the cavity with eugenol and applying a very thin film of liner over the dentin. In the treatment of very deep cavities with insufficient dentin to provide strength over the pulp, the eugenol and the thin film of liner are applied and a secondary base of zinc oxyphosphate cement or zinc oxide-eugenol is placed and allowed to set hard before the permanent restoration is placed. In pulp capping, the liner is gently flowed over the exposure to a thickness of about 2 mm. In pulpotomies, a layer of similar thickness is recommended. A very thin film of liner should be flowed over the prepared tooth in cementing crowns and inlays, to protect the dentin from the irritating effect of the cement liquid. The liner may also be used in root canal sealing.

Prosthetic dentistry

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Crown and bridge

Hydrocolloid impression technique for pinlay and post crown preparations

O. F. Makinson. *Brit.D.J.* 100:200-203
April 17, 1956

The following technic for the production of a cast pinlay retainer with wrought wire pins using colloid impressions has been in use with success for over three years at the Eastman Dental Hospital in London.

The pin wire used in the final casting is 0.5 mm. diameter platiniridium wire. The pinholes are cut with a no. ½ round bur. The pinholes are cut parallel to each other and are from 2.5 to 3 mm. long (Fig. 1). With the use of either the alginate or agar colloid impressions, the gingival margin is packed away from the tooth in the usual manner (Fig. 2).

Short pieces of 0.5 mm. diameter stainless steel wire are smoothed off at one end so that the pin will enter freely 0.5 mm. internal diameter stainless steel orthodontic tubing. The other end of this wire is bent so that it will be retained adequately by the impression material. These stainless steel pins are placed into the pinholes of the preparation and should be short enough not to interfere with the impression tray when it is placed. Any tendency to looseness of the pins in the pinholes is prevented by placing a small piece of red or black carding wax in the mouth of each pinhole before inserting the pin. On removal of the impression, the wax will come away cleanly from the pinhole attached to the pin.

The usual procedure of taking the colloid impression is followed (Fig. 3).

Pieces of 0.5 mm. internal diameter stainless steel tubing are cut the same length or slightly

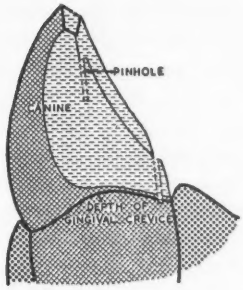

Figure 1 Pinholes are parallel to each other

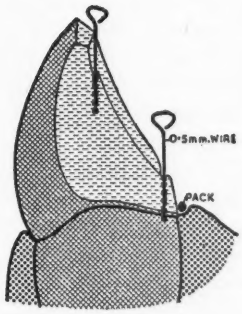

Figure 2 The gingival margin is packed away from the tooth

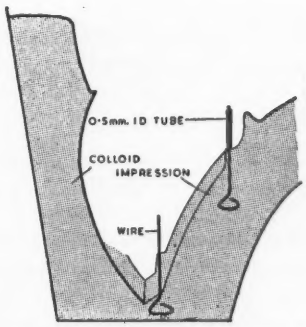

Figure 3 The usual procedure of taking the colloid impression is followed

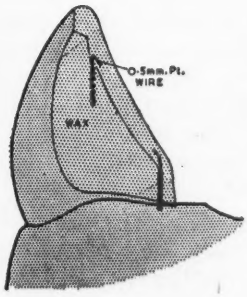

Figure 4 The retainer is waxed up with the wire in position in the pinholes

shorter than the length of the pins projecting from the colloid. The pieces of tubing are placed over these pins (Fig. 3), and the model is poured in hard stone. When hardened, the model is removed from the impression and the gingival margin of the preparation is exposed by trimming away the gingiva down to the bottom of the crevice.

The retainer may now be waxed up in the usual manner with 0.5 mm. diameter platiniridium wire in position in the pinholes (Fig. 4).

Two technics for post crowns, using a colloid impression, are also described. The advantages of the use of colloid for post crowns are (1) the good alignment between the root face and the post canal, and (2) the alignment of the preparation with the adjacent teeth.

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Complete dentures

Effect of adhesive powders on the fit and position of complete dentures

(Über die Einwirkung von Haftpulver auf das Prothesenlager)

Werner Reither. *Zahnärztl.Rundschau* 65:383-391 Aug. 20, 1956

After a complete denture has been worn for a considerable time, it may require rebasing. Often this rebuilding is of a minor nature. It may mean taking off a little of the slack which has resulted from shrinkage of tissue. It may mean adjusting the occlusion to conform with recently acquired chewing habits.

Sometimes the facial appearance of the patient has changed because his denture has been sagging and new wrinkles and creases have formed in his face.

Soreness and discomfort often are caused by upward or downward shifting of the denture.

Whatever symptoms are observed, one fact is evident: the denture no longer fits.

Treatment is comparatively easy. A new impression will reveal the alterations which have taken place. Because even otherwise well-fitting dentures may be loosened by an unbalanced occlusion, the direction and location of the stress have to be checked. Just as fingerprints are different in each person, so are individual chewing habits.

Denture adhesive powders may have a legitimate use, but certainly not to hold poorly fitting dentures in position. If the fit is poor, adhesive powders and pastes often make the condition worse. Because dentures seem to stick tightly after adhesive powder or self-curing acrylic pastes are used, the patient may think that he can get by without consulting his dentist.

Construction of a perfectly fitting denture is one of the most difficult tasks in dentistry. It would be a miracle if a patient would be able to parallel the work of a skilled dentist by simply dusting on an adhesive powder or squirting on a lining paste.

Therefore, every package of adhesive denture powder should contain the following statement: "Ill-fitting dental appliances may impair health—consult your dentist for periodic examination."

Adherent denture powders usually are made from finely pulverized vegetable gums such as karaya, acacia or tragacanth. These materials, mainly consisting of carbohydrates, swell to many times their original size on the addition of water (saliva), and assume mucilaginous or gelatinous properties.

During recent years, several denture adherent pastes have achieved some acceptance (more among patients than among dentists). These pastes consist mainly of karaya gum, petrolatum, coloring and flavoring.

Some dental practitioners use adherent powder on baseplates during denture construction to secure additional stabilization while taking the bite and making registration records.

In some instances, it may be desirable to advise a patient to use an adherent powder on his denture as a temporary measure. Continued use over a period of time, however, should be discouraged.

Some of the most completely ruined mouths a dentist ever encounters are produced by "do-it-yourself" methods in fitting dentures with adherent powders or pastes.

Certainly, the patient should keep his dentures well-fitted, but the fitting has to be done correctly and professionally.

Orthodontics and pedodontics

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Orthodontics

A removable incisor-retractor

G. H. Roberts. *D.Practitioner* 6:220-221 March 1956

Some patients with protrusion of the upper anterior teeth can be treated by extracting the upper first bicuspids, moving the cuspids distally with a removable appliance, and then retracting the upper incisors with a second removable appliance. The patient for whom this form of treatment may be used has a normal, or less than normal, amount of overbite with an increased overjet and forward axial proclination of the upper incisors and cuspids.

For the simple removable appliance to retract the four incisors, modified arrowhead clasps (Adams, 1950, 1953) are made of 0.7 mm. stainless steel wire for the upper central incisors on a stone model. An apron spring with two coils is then formed of 0.5 mm. stainless steel wire and curved to form a suitable contact with the incisors. The free ends of the spring are annealed. Two lengths of stainless steel tubing with an internal diameter of 0.5 mm. are then slipped over the free ends of the apron spring as far as the coils (see illustration).

Next, the tubes containing the free ends of the spring are bent to lie between the previously retracted cuspids and the second bicuspids, and then adapted to the palatal surface of the model. The coils are arranged to lie in the region of the cuspid apexes, but not so high in the sulcus as to cause ulceration when the finished appliance is later inserted in the mouth.

The free ends of the spring are thus firmly held in the tubes because of their curved shapes. Annealing the wire reduces strain inside the tubes and avoids fracture of the wire or tubing caused by metal fatigue.

Two small pieces of 0.5 mm. wire are added as stops to prevent any forward movement of the cuspids while the incisors are being retracted.

In waxing up, a space is left behind the four upper incisors so that these teeth may move backwards when the completed appliance is fitted in the mouth.

The appliance can also be used to retract lower incisors in Class III patients where the lower cuspids have been moved distally after removal of the lower first bicuspids. In these instances, a metal lingual bar is fitted behind the four lower incisors below the level of the gum margin and standing about 1.0 mm. away from the soft tissue.

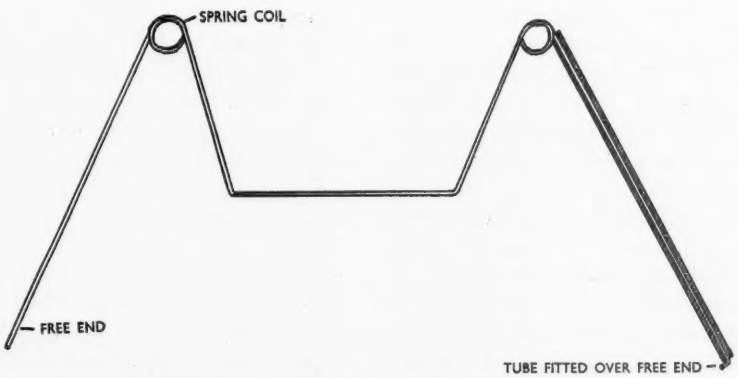


Diagram of 0.5 mm. apron spring showing tubing fitted over one of the free ends before being bent to fit the model

Orthodontics—simple and complex

Melvin I. Cohen. *Harvard D.Alumni Bul.* 16:3-10 July 1956

The problems of thumbsucking, cross-bite, space maintenance and fractures have orthodontic aspects.

No treatment is recommended for thumbsucking children while the deciduous teeth are still intact. If the habit is stopped before the permanent teeth begin to erupt, the possibility is great that no lasting damage will occur. The tongue and the orbicularis oris muscles probably will reshape the distorted alveolus.

When the thumbsucking habit persists after the permanent teeth begin to erupt, the dentist must act. The first step is to talk with the child and try to initiate a desire on the part of the youngster to break the habit. He can be shown casts of the jaws and asked to note the great protrusion caused by thumbsucking. A demonstration of the harm being done is more effective than a lengthy verbal description. The child is then asked if the dentist can make something for him that will remind him not to suck his thumb.

The appliance of choice is a removable Hawley type of appliance with anterior elastics. Palatal bars imbedded in the acrylic resin appliance remind the youngster to remove his thumb. The patient can no longer build up the negative pressure which produces the pleasurable sucking sensation. The anterior elastic acts as an orthodontic appliance to retract the anterior teeth.

For patients who will not use the removable appliance, a permanent appliance is made with two molar bands, a lingual arch wire, and two bars soldered across the palate to bar the thumb.

Posterior unilateral cross-bites in children should be corrected at an early age, to allow the dentition to continue to develop under the most favorable environment. A unilateral cross-bite may be the result of a bilateral deficiency of the maxilla; in such instances, an appliance is used which will widen the upper arch bilaterally.

Space resulting from the premature loss of deciduous teeth may be maintained by many types of appliances, including gold castings, stainless steel crowns, a T-bar, a Rocky Mountain crown, and a soldered lingual arch wire.

The use of orthodontic bands and wires can be helpful in treating children whose jaws have been fractured. If the fracture occurs in a youngster with only partially erupted teeth or loose deciduous teeth, the immobilization becomes proportionately difficult. The appliance should be designed not only to stabilize the parts for healing but to bring about the best possible occlusion.

The relation of speech defects and malocclusion

Murray Bernstein. *Alpha Omegan* 50:90-97 Sept. 1956

An investigation was undertaken to determine whether any significant difference exists in the number of malocclusions found in a group of children with speech defects and in a similar group with normal speech. A further objective was to determine whether there is any relation between malocclusion and speech defects.

Of the 11,243 pupils in the public schools of Lynn, Mass., there were 712 with speech difficulties, of whom 437 were examined for malocclusion. The children ranged in age from 6 to 17 years. The following conclusions were reached:

1. Children with speech defects do not have a greater amount of malocclusion than do children without speech defects.
2. Speech defects are not related to malocclusion generally except in the classification of open bite.
3. In the classification of open bite there is a strong relationship to lisping.
4. In open bite, the severity of the lisp does not vary with the amount the bite is open nor with the amount of overjet.
5. The severity of the lisp in children with malocclusion does not appear to depend on the amount of open bite, overjet or overbite, but more data is necessary to reach a more definite conclusion.

The speech defects of cluttering and stuttering are held to arise from physiologic and psychogenic causes rather than anatomic. Several investigators have found that patients with malocclusion, no matter how severe, compensate and adjust their speech to the difficulty.

Pedodontics

Finger sucking as a cause of dentofacial anomalies

H. Haralambakis. *Odontostomat.Progress* 10:1-12 Jan.-Feb. 1956

Finger sucking is a symptom of abnormal neurosomatic development. It is the cause of dentofacial disturbances which can be self-correcting if the sucking stops before the child's permanent anterior teeth erupt. After this point, self-correction depends on such factors as the duration, the vivacity and the frequency of finger sucking, construction of the bones and function of the surrounding muscles.

As the child grows up his finger sucking may be converted to other oral habits such as defective swallowing and protrusion of the tongue.

The psychologic cause of the finger sucking habit should be sought. Care must be taken so that the child does not interpret treatment as punishment, but only as a means to rid him of this bad habit. The various methods of treatment are designed to make the child conscious that he is trying to suck his fingers. One of the effective methods of treatment consists of the use of orthodontic appliances.

An approach to the dental treatment of children afflicted with cerebral palsy

Roy L. Lindahl. *Am.J.Phys.Med.* 35:125-129 April 1956

Within the past few years there has been an increased interest in the dental problems of all handicapped children. Those children afflicted with cerebral palsy have been an especial challenge to the profession. The dental treatment of these children is in need of more study and application.

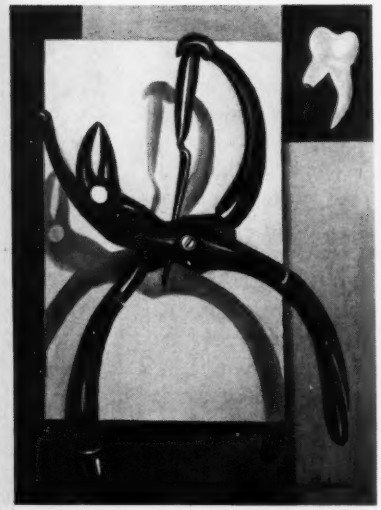
The child afflicted with cerebral palsy has a real handicap, and this condition may elicit a feeling of sympathy toward the child by the parent. As a sign of affection toward the child with cerebral palsy, the parent may tend to give the child more "sweets" than would be given normally. As a result of the increased intake of refined carbohydrates by the child and the local influence of the carbohydrates on the teeth, the child will manifest an increased incidence of decay.

Dental treatment for the cerebral palsy patient should begin at two and a half to three years of age or earlier if decay is found on visual examination. If the decay in the deciduous teeth is not removed and extraction becomes necessary, the remaining teeth may drift and create space closures which ultimately result in the need for orthodontic treatment. Malocclusion may result also from poor muscle tone or poor muscle control, and if these factors are present and then teeth are lost prematurely, the problem becomes almost hopeless.

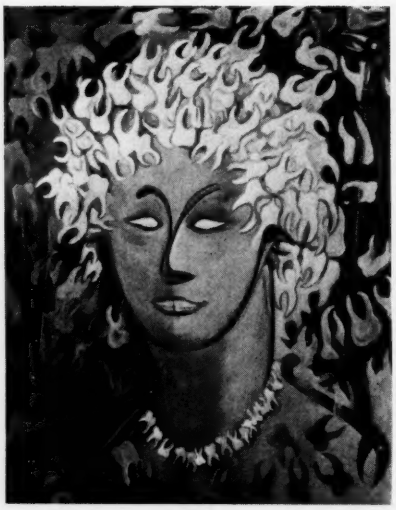
Before a cerebral palsy patient receives dental care, the dentist should have a reasonably accurate estimate of the child's mental capacity. The physical disability of the patient should be considered along with the mental ability so that a favorable treatment plan may be evolved which will be of maximum benefit for the patient and the dentist.

Treatment should be complete in regard to removal of all dental decay and infected teeth. The replacement of lost teeth may be accomplished by the use of fixed appliances. Some patients may have a disability such that it would be impractical, if not impossible, to utilize a removable prosthetic appliance. Involuntary movements of the tongue, cheeks and lips may not permit the dentures to remain in their intended position, and the continual movement of the appliances may then create a chronic source of irritation to the soft tissues.

No dental therapy should be instituted before a complete diagnosis and plan of treatment are made. If anesthesia is desired, any acceptable local anesthetic solution may be used. The child should always be handled on the basis of the physiologic and psychologic age, because reactions will be based on these factors. The level of the approach is not always easy to determine because the patient's reaction may be modified by his inability to speak or his anxiety about the treatment which is to be rendered.



Suicide



Eve

Composition

Professional activities

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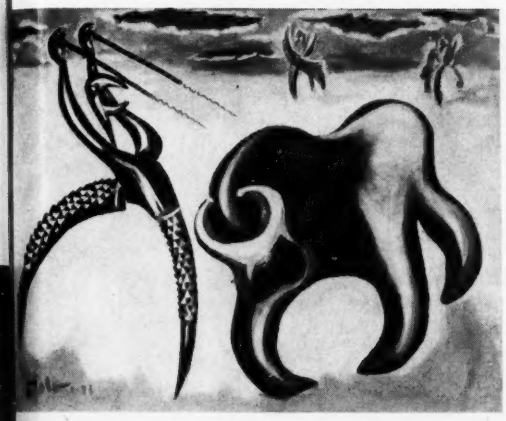
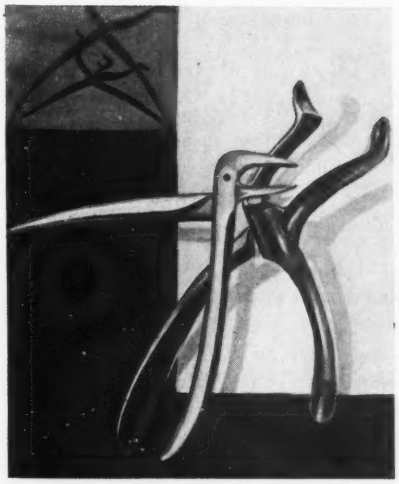
Art

The January and June 1956 issues of *Dental Abstracts* contained reproductions of "dental paintings" by the French dentist, David Solot, which previously had appeared in Dutch, French and German dental journals. Many of our readers indicated that they would like to see more samples of this new art form. *Dental Abstracts,* therefore, presents seven more examples of Solot's art. The reproductions, however, cannot do full justice to the beauty, color and humor of the originals.

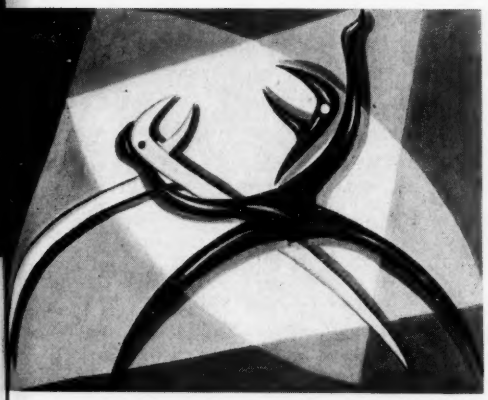
Despite his success as an artist, David Solot still spends most of his time in his dental office in Paris. Looking at his instruments and at his patients' oral conditions, he becomes inspired and begins to paint. (Illustrations reproduced by courtesy of Lederle Laboratories Division, American Cyanamid Co., Pearl River, N.Y.)



Bull fight



Minuet



Dance of the forceps

Molars and forceps

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Dentistry around the world

Fakirs, snake charmers and [charlatan] dentists in Afghanistan
(Fakire, Schlangenbeschwörer und Zahnärzte in Afghanistan)

Gustav Pfirrmann. *Zahnärztl.Praxis* 7:12 Aug. 15, 1956

Afghanistan has an area of about 245,000 square miles and a population of 13,000,000.

A traveler usually visits first the ancient cities in the valley of the Indus river, and then the sacred metropolis of Kabul. Rickshas are the only transport vehicles available in Kabul and Amritsar, and the ricksha coolie usually is a good guide to show the traveler the sights.

The main market place, at all times, is full of public entertainers, among them fakirs, snake charmers and—it is hard to believe—"dentists."

The performance of the "dentist" attracts the largest crowd. As a sign of his profession, a heap of extracted teeth is placed on a worn-out carpet in front of his booth.

Before the "dentist" attempts to extract the tooth, a carious third molar of a young Indian man, he has to finish tattooing a chicken on a crying boy's arm. Tattooing seems to be a secondary occupation of Afghan dental charlatans.

Then the preparation for the show's main event, the tooth extraction, begins. With crossed legs, the "dentist" is seated on his large carpet. He wears nothing but a red waistcloth and a large, tattered, filthy and formerly white turban.

During his examination of the diseased tooth, which he touches and twists with his not too clean fingers, the audience draws nearer and nearer. The patient's young wife, wearing a colorful sarong, and exhibiting proudly the sign of her caste on the forehead, shows affection and compassion for the suffering husband with long embraces and kisses.

Finally, the "dentist" reaches for his large forceps, which resemble open-throat pliers, and tries to extract the tooth with the attitude of a weight lifter. The audience accompanies every effort with cries of excitement. The movement of the charlatan and the reactions of the patient form a rhythm.

An ecstatic cry, a last forceful jerk, and the triumphant "dentist" shows his audience the extracted molar. The "dentist" then tears a piece off his turban, stuffs it in the bleeding wound, probably for disinfection. The show has ended.

The activities of charlatans in Mexico
(Das Kurpfuschertum in Mexiko)

Ernesto Cohn, Puebla, Mexico. *München.med.Wschr.* 98:203-204 Feb. 10, 1956

The overthrow of the Aztec empire by invading Spanish forces, between 1519 and 1521, the execution of the last Aztec emperor, Cuauhtémoc, and the rapid extension of the Spanish conquest introduced the colonial period of Mexican history. In contrast to the other territories of "New Spain," the conquerors found in Mexico a "Golden Age" of culture, and a comparatively high standard of medical science. Spanish historians revealed that the native healers in Mexico cured diseases with means unknown to the European physicians.

During the 300 years of Spanish domination, all medical and dental knowledge and experience of Aztec science was lost, and only distorted remnants of this period were carried over to present time. These traces of Aztec medicine and dentistry still exist among the native population, but are mixed with Christian ideas and often misunderstood doctrines of modern science.

Folk medicine is in the hands of sorcerers and faith healers. As in many other countries, patients include people from the larger cities where professional treatment is available.

Sorcerers, in diagnosing medical and dental diseases, first feel the patient's pulse to find out "what the blood tells," then they throw grains of corn over ancient playing cards. Each card is associated with a certain disease. Many sorcerers, before examining the patients, eat mushrooms containing narcotics, and the diagnosis is made during the charlatan's trance. Sorcerers and patients then pray to the ancient Aztec gods, to the spirits of mountains, hills, caves and rivers, to the

saints of wind, lightning and thunder, or to the sun, the moon and the stars.

Mexican sorcerers, however, seldom attempt surgery in any form. Their advice consists mainly of dietary changes or prohibition of sexual intercourse, no matter what type of disease is present. Frequently they state that the disease was caused by a spell cast by a rival sorcerer. In such an instance, meetings between the sorcerers of the entire area are held, and the case discussed. Sorcerers of both sexes are feared by the natives; other charlatans, however, enjoy a high degree of esteem.

Mexican charlatans know and describe remedies comparable to those advocated by homeopathists, and their therapeutic procedures resemble those used in homeopathy. If the treatment prescribed is unsuccessful, the patient usually is referred to a faith healer.

Mexican faith healers do not differ from those in other countries. The prayers for cure are based on a distorted form of Catholicism.

Among Mexican charlatans, there are "specialists" of great renown, and many patients prefer to consult these "healers" rather than visit licensed physicians or dentists.

Neither the Mexican medical organizations nor the dental association have, as yet, found the way to counteract the activities of the charlatans.

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Licensure

The "hidden" activities of charlatans
(Über "versteckte" Ausübung der Heilkunde)

R. Schüppert. *München.med.Wschr.* 98:1068-1069 Aug. 10, 1956

In Germany, the medical and dental organizations are often unable to fight successfully against a new type of charlatanism, the hidden practice of medicine and dentistry by representatives of pharmaceutical firms. The German civil law requires evidence of a violation in the form of an "open" medical or dental practice.

Recent cases before German courts, however, have revealed that these supersalesmen visit the homes of patients, offer and sell their remedies. They make claims exceeding the already unsubstantiated claims of the manufacturers, and in many instances, treat—in the form of tests—the patients.

To check such activities, the governmental authorities still insist that the accusing organization prove that the salesman's actions have been carried out in a form that resembles medical or dental practice.

The accused never admit unlawful practice, and the attitude of the patients seldom permits the establishment of evidence.

The attention of the authorities, however, should be drawn constantly toward such hidden practice. If evidence can be obtained in regard to (1) attempts to acquire patients, (2) direct sale of drugs to patients, and (3) administration of drugs suitable for specific diseases, such hidden charlatans certainly would be subject to criminal investigation and punishment.

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Civil defense

The proposed role of the Public Health Service dental officer in a national emergency

Norman F. Gerrie. *Mil.Med.* 119:26-29 July 1956

Most Public Health Service dental officers on active duty are assigned to Coast Guard duty and to the many hospitals and other stations around the country in which beneficiaries of the service receive treatment. The role of these PHS dental officers in time of national emergency is, in many respects, similar to that of the dental officer in the Army, the Air Force and the Navy. Their primary responsibility would be to provide treatment for military components and legal beneficiaries of the service, and their secondary responsibility would be to provide care of the civilian population.

At all PHS installations throughout the country, plans have been developed for large scale disaster situations resulting either from peace-

time accidents or enemy action in wartime. Emergency teams have been organized that are prepared to go where needed, and dental officers are members of these teams.

The Public Health Service has been assigned responsibility for recruiting and training an inactive duty Commissioned Reserve Corps composed of professional personnel to be trained for the restoration and maintenance of normal public health functions in emergencies. A considerable number of dentists in private practice have been recruited for the Commissioned Reserve, and key officers in this group have attended training courses. Dental and medical officers for the Commissioned Reserve are being recruited, generally, from nonpublic health activities.

In time of need the basic public health personnel of physician, sanitary engineer and nurse would be called on first. If their number is inadequate, other health personnel, such as dentists, would be called on to perform appropriate basic health services. In a major emergency the dentist would not be rendering his usual professional service but would assist in providing other more urgently required health services. The role of the trained PHS dental officer in the field of public health approaches most closely that of the medical officer.

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History

Latin-American dental journals of the XIX century (La prensa dental Latino-Americana del siglo XIX)

C. Mena Serra. *Gac.odont.* 2:293-302
No. 5, 1956

Several Latin-American republics claim priority in the publication of dental journals in Spanish. Several Latin-American historians of odontology probably are not informed of the fact that the priority goes to Cuba. The first dental journal published in Latin America was *Revista Médico Quirúrgica y Dentística* which was issued for the first time on April 1, 1856, in Havana, Cuba, under the editorship of Dr. E. Wilson and Dr. Gonzalez. An advertisement of *Revista Médico Quirúrgica y Dentística* was published in the Cuban paper *El Diario de la Marina*, volume 25, no. 55, page 1, column 8, of June 28, 1868. Priority in publication was attributed to Cuba in several dental journals for several years. In the book *Historia de la Odontología* of Salvador Lerman, a Latin-American historian of dentistry, it appears that a dental journal under the name of *Arte Dentaria* started publication in Rio de Janeiro under the editorship of Dr. J. Borges Diniz in 1869. Chronologically, priority in the publication of dental journals in the continent goes to the United States; in the Latin-American countries, to Cuba. A chronologic list of Latin-American dental journals is given.

John Smith, M.D., F.R.C.S., F.R.S.E., LL.D. 1825-1910

J. Menzies Campbell. *Brit.D.J.* 101:33-40
July 17, 1956

To celebrate the centenary of the teaching of dental surgery in Edinburgh, this commemorative oration was delivered before the Royal College of Surgeons of Edinburgh. John Smith on June 2, 1856, delivered the first lecture of his course on the physiology and diseases of the teeth. The course of ten lectures embraced the following subjects: special anatomy of the mouth; classification and anatomy of the teeth; microscopic structure of enamel, dentin and cementum; development of teeth with dentition and associated disorders; irregularities and injuries of the teeth; necrosis, exostosis, caries and diseases of the pulp and periodontal tissues; dental surgery including anesthetics, instruments with their mode of use, and special operations and accidents.

Smith, born in Edinburgh in 1825, was the son of a dentist. He received his M.D. degree in 1847 and was ambitious to pursue a career in medicine and surgery. On the death of his father in 1851, however, he stepped into his father's dental practice. In 1857 Smith was appointed surgeon-dentist to the Royal Public Dispensary. In 1860 Smith founded the Edinburgh Dental Dispensary, to provide dental treatment for the poor and needy. This institution, on Smith's recommenda-

tion, ultimately became the Edinburgh Dental Hospital and School.

In 1871 Smith was appointed surgeon-dentist to Her Majesty the Queen in Scotland. As a member of the Dental Reform Committee launched in London in 1876, Smith helped found the British Dental Association, and served as its fourth president. He was a member of the first editorial committee of the *Journal of the British Dental Association.*

Smith contributed many articles to professional journals, wrote a "Hand-Book, of Dental Anatomy and Surgery for the use of Students and Practitioners," and adapted Sir Walter Scott's novel *Waverley* for the stage. John Smith died in 1910 in his eighty-sixth year, in Edinburgh.

▼ Practice administration

Office and financial management

Clyde O. Wells. *J.Georgia D.A.* 30:6-11 July 1956

The day is past when the dentist feels he must work for everyone who comes in—emergencies excepted—with no regard for payment. The dentist is as much at liberty to investigate the patient's financial responsibility as do the merchant and banker. The dentist should belong to the local credit bureau, if such exists.

The dentist's office should be located on a good street, with parking space. The office should have sufficient operating rooms and sufficient auxiliary help. The dentist can increase his income 50 per cent with a second operating room, and 25 per cent more with a third. These rooms should be equipped alike with complete equipment in each. The office should have a receptionist or assistant who can greet patients without delay. The person in the office who answers the phone should have a pleasing voice and should be trained in how to answer the phone.

The professional man should plow back a portion of his income into his office, to replace equipment and keep the office up to date.

In this day of high incomes for labor, the dentist should set his fees sufficiently high to permit him to live well and accumulate a competency for his retirement.

The secret of getting ahead financially is to establish a regular program of saving and investments. This requires strict budgeting. The most important investments for the dentist are, first, modern equipment for the office; then a home; insurance sufficient to cover all indebtedness and to permit his family to live reasonably well until the children are educated and grown; then purchase of land and construction of a dental office on it. The property should be so located that its value will be enhanced as the town grows. Finally, after the home and office have been acquired, the dentist should set up a regular system of investing monthly in government bonds, investment trust securities, and good common stocks. He should have no trouble in investing $250 monthly in this manner. By the age of 55 he should have accumulated $65,000 in this way, enough to assure him a degree of security.

To assure the proper disposal of his estate at death, the dentist should make a will, and so should his wife. Many times an estate is taxed twice, an eventuality which could have been avoided by following the advice of an attorney trained in tax and estate matters.

The dentist's wife should administer the home budget so that she learns how to handle money. She can then administer the estate with a minimum of trouble.

▼ Auxiliary groups

Incorporating a dental hygienist in a private dental office

Patricia C. Stearns. *New Mexico D.J.* 7:9-12 Aug. 1956

The dentist receives several benefits by enlisting the services of a dental hygienist. He makes an investment that increases his gross office income by at least 20 to 30 per cent. He builds his practice by delegating to an employee certain time-

consuming duties which otherwise he would have to perform. He gains personal satisfaction and practice stability by increasing and improving dental services for the general welfare of the people in his community.

A well-established dentist in a western state has three operating rooms and employs a full-time hygienist, a laboratory technician, an assistant and a full-time secretary-receptionist. The dentist uses two operating rooms and the hygienist uses the third. The hygienist works five days a week, and averages eight or nine complete prophylaxes for adult patients a day. Her actual working time at the chair averages 45 minutes for adults and 20 minutes for children. The average fee for an adult is four to five dollars an appointment. The fee for a small child is four dollars and for an older child, five dollars. The hygienist is paid on a commission basis of 66.6 per cent of the total fees charged for the services she performs. Her income ranges between $600 and $700 a month, and her services add $300 to $350 a month to the income of the office after her salary has been paid. Her employment has increased the dentist's gross income by from 20 to 30 per cent.

The dentist with a two chair office who employs a hygienist should install a third chair for her use. Dental supply companies estimate the average cost of a completely equipped third operatory ranges between $3,000 and $4,000. If the third operatory were furnished with used equipment, the average total expense would range between $1,500 and $2,000.

An investment of $4,000 (amortized over a ten year period at $400 a year) for the physical arrangements, a $5,000 salary for the hygienist and an allowance of $600 for overhead would be a total maximum investment of $6,000 a year.

A typical work day for a hygienist once established would be as follows:

4 adult prophylaxes at $5.00	$20.00
1 child prophylaxis at $3.00	3.00
1 topical fluoride application at $3.00	3.00
1 full mouth roentgenogram at $15.00	15.00
3 bitewing roentgenograms at $4.00	12.00
	$53.00

In a five day week the hygienist would gross $265 or $13,250 for 50 weeks. With the $6,000 annual expense deducted, the dentist would make a net profit of $7,250 a year, and would be further adding to his own income by utilizing the time previously allotted to these services for more extensive dental service.

Position and rank of medical and dental assistants in the Yugoslavian army medical and dental corps

(Položaj i uloga lekarslog promoćnika u sanietskoj službi)

Niko Bratanič. *Vojnosan.pregl.,Belgrade* 13:277-283 May-June 1956

Recent enlistment of medical and dental assistants into the Yugoslavian army medical and dental corps has improved the services rendered by these corps.

The advantage to be gained by including these skilled workers frequently has been weakened by the attitude of regular army officers, army physicians and dentists.

These superior officers did not always use the abilities and possibilities of the assistants. There was little opportunity for advancement and specialization. Many of the physicians and dentists feared the ambitions and pretensions of dental and medical assistants. The work assigned to assistants was limited, and they were treated no better than male nurses.

Superior officers, however, have no right to limit the professional activities of dental and medical assistants, especially when these assistants already have proved they have special qualifications. In the interest of the army, dentists and physicians should help their assistants to develop additional knowledge and skill.

In the National Assembly of the People's Federated Republic of Yugoslavia, a law was introduced to elevate the position of medical and dental assistants serving in the armed forces to the rank of medical and dental officers (second lieutenants). These new officers should later be able to obtain even higher ranks, and new opportunities should be opened for them, not only in their special fields but in the administrative branch.

Students who have finished courses at the special school for medical and dental assistants with excellent marks should be permitted to enter medical or dental academies. After graduation, they should enter the army as physicians or dentists. An increase in numbers in both professions is urgently needed in the Yugoslavian army and in civilian life.

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Forensic dentistry

Identification in the "Ormen Friske" disaster (Odontologisk identifiering av omkomna från "Ormen Friske")

Karl O. Frykholm. *Odont.Tskr.* 64:56-67 Feb. 1956

In June 1950 the Swedish replica Viking ship "Ormen Friske" was lost off Heligoland in a storm. The crew of 15 young Swedish men were drowned. Eight bodies were found and identified. Those last recovered were greatly changed, as they had been lying in the North Sea for a couple of months. This was the first complicated case that was subjected to dental identification combined with an investigation by the National Institute of Technical Police in Sweden. The author carried out the dental part of the "Ormen Friske" investigation at the request of the Institute.

One of the victims of the sea disaster was examined by experts in forensic medicine, was "identified" by the experts and "recognized" by the father and buried. A study of the dental records demonstrated that an error in identification had been made, and proved that the body was that of another person. The body was exhumed and a renewed examination proved the dental identification to be correct.

In forensic dentistry, extreme thoroughness is an absolute necessity. The dental records of the deceased must be obtained from the victim's dentists as far as that is possible. Relatives and friends frequently can give some information regarding dental characteristics. Roentgenograms must always be taken of teeth and jaws for comparison with roentgenograms taken before the death of the victim. Had that been done in this instance, the corpse would never have been buried under the wrong name.

Dental identification has its limitations but it always should be tried when the identification otherwise is uncertain. In this instance the method proved capable of solving problems of identification when other methods failed.

According to Swedish law every dentist must keep a careful record of the patient's name and address, of the treatment given and the date of the treatment. The dental records must be kept for at least ten years.

The subject of forensic dentistry must be given a firmer status. At the Royal School of Dentistry in Stockholm the subject is voluntary. Those interested receive 12 hours of teaching each term.

Malpractice: tooth broken during administration of anesthetic

J.A.M.A. 161:1099-1100 July 14, 1956

The plaintiff filed an action against the defendants, an oral surgeon and an anesthetist, for damage allegedly caused by their malpractice in administering a general anesthetic preparatory to the extraction of all her teeth. From a judgment in favor of the defendants, the plaintiff appealed to the Supreme Court of Louisiana.

The plaintiff's dentist had advised her to have all her remaining teeth extracted because of a long-standing periodontal condition, and had recommended that the extractions be done under a general anesthetic by the defendant oral surgeon.

The defendant anesthetist prepared the plaintiff for the operation, resorting to nasal endotracheal intubation which leaves the mouth unobstructed. The anesthetist first gave ether to the plaintiff through a mask placed over the face and, when a deep sleep ensued, inserted the intratracheal tube with the aid of a laryngoscope (a metallic instrument about the size of a household flashlight). When the laryngoscope was removed from the patient's mouth, both the defendant oral surgeon and the defendant anesthetist noticed a bleeding socket, from which a tooth was missing, in the upper anterior part of the plaintiff's mouth. When they were unable to find the tooth in her

mouth or on the table, a roentgenogram was taken that disclosed the tooth in the plaintiff's right lung. It was promptly and skillfully removed in the bronchoscopic room of the hospital. Because of this accident, the planned operation was not performed on that day.

The plaintiff contended that the doctrine of *res ipsa loquitur* applied in this instance and that the defendants therefore had the obligation of showing that they had not been guilty of any negligence. The court of appeals agreed that the doctrine did apply but held that the defendants had produced sufficient evidence to indicate that they were not guilty of any negligence. The Supreme Court of Louisiana was of the same opinion. A physician, said the court, is not required to exercise the highest degree of skill and care possible but only that degree of skill ordinarily employed under similar circumstances by the members of his profession in good standing in the same community, and to use reasonable care and diligence.

Here the evidence clearly established that the defendants were eminently qualified by education and experience to practice their professions and that in the administration of the anesthetic they did everything reasonably required of them under the circumstances. The judgment of the court of appeals in favor of the defendants was affirmed.

The dentist and malpractice

Louis J. Regan. *J.South.California D.A.* 24:20-28 Sept. 1956

Malpractice claims against dentists are increasing, and many judgments in considerable amounts are being recovered against them, especially in the field of prosthetic dentistry. The following allegations are among those which most frequently appear in complaints brought against members of the dental profession: slipping of instruments, broken needles, root left in socket, lack of consent, extraction of wrong tooth, flying fragments entering the respiratory passages, injury in fitting or from ill-fitting dentures, infection from the use of unsterile instruments, fractures and dislocations of the jaw, death from anesthetics, and failure to advise the patient of injury or of a condition such as a fragment of broken needle remaining in the tissues. The essence of the complaint always is that the accused dentist failed to possess or to exercise the degree of skill and care commonly possessed and exercised by other reputable dentists in the locality.

The courts almost uniformly hold that a dentist is bound (1) to use reasonable care in the performance of his professional services, (2) to act according to his best professional judgment in treating his patients, and (3) to possess and exercise that degree of skill and learning which is ordinarily possessed and exercised by members of his profession in the same field of practice in the same general neighborhood. One who holds himself out as an expert in a particular field of dentistry is held to a higher degree of care and skill than an ordinary practitioner.

It is the duty of the dentist to follow explicit instructions when such are given him by the patient. If he exceeds the instructions given him, he is guilty of a technical assault. The dentist or physician must make a sufficiently full disclosure of all the pertinent facts so that the patient may be in a position to decide intelligently whether or not to submit to further or to any treatment. A dentist's liability for negligence or malpractice extends to acts or omissions of his employees, within the scope of the employment.

Many legal cases are cited to illustrate the principles of law relating to malpractice.

Most dentists protect themselves with professional liability insurance.

Identification of criminals by dentists: determination of tooth marks left at the scene of crime

(Die Identifizierung von Bisspuren durch den Zahnarzt)

Gustav Korkhaus. *Deut.zahnärztl.Zschr.* 10:1769-1778 Dec. 1955

The determination of tooth impressions left at the scene of crime often plays an important part in tracking down criminals. When persons suspected of having committed a crime have undergone changes so extensive that their external characteristics yield no information, their teeth

or tooth impressions often are the only clues for identification.

In criminal cases in which identity can be determined by dentist's records or similar data, the most substantial evidence consists of the fact that the tooth impressions of two persons (with the probable exception of uniovular twins) are as dissimilar as fingerprints. There are many instances in which isolated tooth marks, or positional or occlusal anomalies helped to identify the victim or the criminal.

The possibility of a clear differentiation of tooth marks is difficult when the wound caused by the criminal's bite appears on the victim's skin. If, however, the criminal bites into an apple, the form of his anterior teeth and the dental arches is preserved in the fruit, and can easily be reconstructed by customary impression technics used in daily dental practice.

Tooth marks, which are often found in instances of murder preceded by rape, are quite different from that found in an apple. Brutal and numerous wounds caused by biting, sucking at the site of these wounds, and the stretching of the skin exerted by such activities alter extremely the condition of the tooth marks left, and reconstruction is difficult and often impossible.

In most instances of crime in which the criminal has left marks of his teeth, a careful examination of the impression marks will reveal that, besides general alterations, other changes, obviously connected with the identity of the criminal, are present. It will be necessary to take into consideration all factors available simultaneously.

In crime investigation, speed is of major importance. Microscopic determination by dentists achieves often a quick result. It should be made on longitudinal ground sections, prepared by grinding on glass from both sides towards the center of each tooth examined. Only a thin slice then remains.

Utilization of reflected light makes an evaluation of the tooth marks possible during the grinding process. Such a preliminary determination can be obtained within a few hours. When polarized light is used, it will be possible to examine simultaneously several tooth marks, and to determine whether all are made by the same mouth.

In spite of the many inadequacies in the methods used by dentists to identify criminals by evaluation of tooth marks, a number of factors, usually not determinable in police laboratories, can be established by dentists. Even though an isolated factor will not always affect the result, determinable changes in the suspect's dentition may bring about the evidence needed or the proof of innocence of the suspect.

To the old saying of crime investigators: "Time will tell!," dentistry now can offer a new saying: "Teeth will tell!"

▼ Miscellaneous

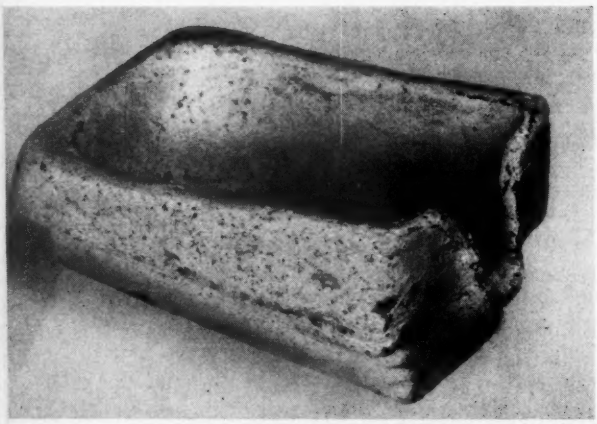
Progress review: oral medicine

Alfred J. Asgis. *New York D.J.* 22:321-324 Aug.-Sept. 1956

Oral medicine is the science and art of diagnosing, treating and preventing diseases and lesions of the oral mucosa and adjacent structures of regional or systemic origin for the promotion of general and oral health. This therapeutic branch of general dentistry has faced obstacles of misrepresentation and confusion that characterized similar barriers to the progress of oral surgery and oral restoration; nevertheless, oral medicine has made rapid strides in the last decade.

Oral medicine dates back to the first joint meeting of dentists and physicians in the United States held at the New York Academy of Medicine in 1926. The idea found full expression in the philosophy of dentistry as a branch of medical science which embodied the formula that the recognition, diagnosis, treatment and prevention of nonsurgical lesions of the oral mucosa and adjacent structures were part of the practice of dentistry.

In 1935, the American Association of Dental Schools first recommended the teaching of oral medicine as a distinct course and outlined its content.



Wax pattern of crucible and crucible after firing

Armamentarium

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Equipment

The use of readily available refractory materials for the construction of dental casting crucibles

D. J. Neill. *Brit.D.J.* 100:278-279 May 15, 1956

The crucible commonly available to dentists for melting casting alloys has two disadvantages: (1) its capacity is sometimes inadequate for a large casting and (2) the cowling prevents adequate heating of the metal.

A simple technic is described for constructing in the laboratory crucibles suitable for dental work. Aluminum is used as the refractory and ethyl silicate as the bonding agent.

A wax pattern of a crucible of adequate capacity is prepared. From this is made a composite hard plaster mold.

The hydrolyzing solution is made as follows: 30 ml. of distilled water and 15 ml. of industrial alcohol (specific gravity 0.820 at 15.5° C.) are mixed, and 1 to 2 cc. concentrated hydrochloric acid added; 200 ml. of ethyl silicate are then added and the solution is mixed and allowed to cool.

The refractory should be graded suitably, and a mixture of equal parts of coarse and fine powders used. The inside of the mold is smeared with petroleum jelly and the parts assembled. The refractory is mixed with the hydrolyzing solution to give a thin slurry which is then poured into the molds and allowed to set in ten minutes. After one hour the mold can be opened and the refractory shape removed.

The refractory shape is allowed to dry out on the bench overnight, and is then fired slowly for four hours up to 1,000° C. and then oven cooled to room temperature. The resulting crucible is suitable for use with gold or chrome cobalt alloys since it remains unaffected by temperatures as high as 1,500° C.

Once the mold has been constructed, any number of crucibles may be made. Other refractory shapes such as soldering blocks and furnace linings also may be produced by this method.

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Therapeutics

Treatment with hydrogen peroxide 30 per cent

(Therapie mit 30 prozentigem Wasserstoffperoxyd)

A. Schüler. *Deut.zahnärztl.Zschr.* 11:410-414 April 1, 1956

The brand of hydrogen peroxide 30 per cent, marketed in the United States as "Superoxol" and in Germany as "Perhydrol," is a strong oxidizing agent which has been used in dental practice primarily for bleaching nonvital teeth and mottled enamel.

Less concentrated solutions of Superoxol can be obtained by dilution. It should be stored in a cool place, preferably in a refrigerator, because it may explode spontaneously if improperly kept. Diluted solutions deteriorate unless preserved by some agent. Catalase may cause the decomposition of hydrogen peroxide into oxygen and water.

Even in its full concentration, Superoxol can be used successfully for treatment of periodontal disease because it is noncaustic. In instances of periodontosis, the periodontal pockets are rinsed for at least one minute with 10 cc. Superoxol. In severe instances, this rinsing should be repeated every week. For the daily oral hygiene, tooth paste can be replaced by a foaming neutral soap.

After tooth extraction, even if the alveoli are infected, a thorough rinse with from 3 to 4 cc. of Superoxol will obtain the desired disinfection. In instances of surgically opened maxillary sinus, similar treatment will not cause any after-effects.

Osteitis is treated with a cotton plug, soaked in Superoxol, which is placed on the involved part of the mucous membrane covering the inflammation of the bone. The resulting blanching of the mucosa reveals the position of the morbid process. Under injection anesthesia, the inflammatory point is opened and rinsed thoroughly with 0.5 cc. Superoxol.

Embolism caused by air bubbles in arteries or veins can be avoided by inserting cotton, soaked in Superoxol, into the center of infection. Such a procedure frequently will make apicectomy unnecessary.

Fistulas can be treated in a similar manner. Large abscesses are opened, and treatment with undilated Superoxol will obtain cure.

Superoxol is noncaustic but highly bactericidal. It permits direct contact between oxygen and cells in the afflicted region.

Modern detergents in dentifrices: their biologic action in dental prophylaxis

(Los detergentes modernos en los dentífricos. Su papel biologico en profilaxis dental)

Carlos Fernández Cabrera. *Odontoiatria, Madrid* 142:571-580 Oct. 1955

As modern detergents are being used increasingly in the manufacture of dentifrices, the knowledge held by chemists and cosmetic experts should be shared by dentists, physicians and the informed public.

The only detergent used in dentifrices until about a decade ago was soap. The limitations of soap, especially in the wool industry, instigated research, which finally produced the synthetic detergents. These compounds act also as wetting agents and emulsifiers. They fall into three groups: (1) cationic, when the hydrophilous group is alkaline; (2) anionic, when it is acid; (3) nonionic, the neutral groups.

The cationic and anionic compounds are active germicides without side effects on the living tissues. The nonionic compounds have no germicidal activity. The anionic are especially effective on gram-positive microbes, whereas the cationic are much more effective and extend their effectiveness, though it is reduced, to the gram-negative germs.

As with other germicides, the effectiveness of the surface active agents decreases in the presence of organic compounds.

The alkyl sulfates, which are anionic, at 1 to 3 per cent concentration, are used in dentifrices as active detergent and foaming agents. Though these compounds are not being used in Spain for dentifrices, undoubtedly they will soon replace soap. Perhaps the cationic group will be used because of its active germicidal properties.

Surface agents of the cationic and anionic groups cannot be used together in the same dentifrice formula because of their incompatibility. The nonionic compounds have no special advantages in dentifrices, as some even favor bacterial growth.

Therapeutic evaluation of bio-flavonoids in periodontal disease

Ellen K. Wellensiek. *Texas D.J.* 74:289-292 June 1956

Two hundred patients with periodontal disease were treated with the citrus bio-flavonoid complex (C.V.P.) in doses of six to nine capsules daily. Each capsule contained 100 mg. of flavonoids and ascorbic acid. Therapy was maintained for from a few days to several weeks. Seven case histories are discussed. Effects were salutary in 190 of the 200 patients treated. The therapy provided relief of discomforting symptoms by minimizing or arresting bleeding when present, and permitted necessary surgery without postoperative complications.

In the treatment of periodontal disease, much attention should be given to the correction of capillary functioning and to the prevention of injury to the capillary wall. In this respect, C.V.P. is of value as a prophylactic and therapeutic agent. It facilitates dental surgery by preventing postoperative bleeding. It decreases inflammation of the gingiva and brings relief to the patient. It should be administered routinely in all instances of periodontal disease.

The principles in the use of antibiotic agents in dental practice

E. Cheraskin. *J.Tennessee D.A.* 36:310-317 Oct. 1956

There are two basic principles in the use of antibiotic agents in dental practice. If an antibiotic drug is administered to a patient, some evidence of improvement should appear within the first 24 to 48 hours. If improvement does not occur, there are three possibilities: (1) the disease is noninfectious and no antibiotic agent is indicated; (2) the disorder may be infectious but the causative microorganism is not sensitive to the antibiotic, or (3) the causative microbe may be one ordinarily sensitive to the antibiotic used, but the particular strain may be resistant to the antibiotic. The second basic principle is that the antimicrobial drug should be continued for 24 hours after all symptoms and signs of disease have vanished.

Antibiotic agents are designed for therapy and for the prevention of disease. A committee of the American Heart Association has published recommendations for dentists to follow, for the prevention of subacute bacterial endocarditis.

The drug of choice therapeutically and prophylactically is still penicillin. Many individuals, however, are now allergic to this agent, and an increasing number of organisms are penicillin-resistant. The broad spectrum antibiotics, notably those of the tetracycline group, are good substitutes for penicillin. Another series of antimicrobial drugs which serve satisfactorily are those of the erythromycin and carbomycin series.

▼ Materials

New conceptions on abrasive and polishing substances (Nuevos conceptos sobre abrasivos y agentes del pulido)

R. Acuña Ortiz. *Rev.dent.Chile* 46:9-14 Jan.-Feb. 1956

Abrasive substances wear away the external layers of dental or metallic surfaces by friction. The abrasive substances, either natural or manufactured, most commonly used in dental work are: carborundum, pumice, rouge (ferric oxide), quartz sand, emery, zinc oxide, corundum, alumina (aluminum oxide), garnet, tripoli, putty powder and chalk.

Carborundum is an abrasive substance as hard as diamond. It is used in powder mixed with glycerin or in mounted stones of various types. The other substances mentioned may act either as abrasive or as polishing agents, according to the preparation of their particles. The degree of

abrasive efficacy of a substance depends on the size, sharpness, form and kinetic hardness of the substance and on the velocity at which the particles move over the surface undergoing abrasion. The best abrasive substances are those that have particles of large grain with sharp edges and of greater hardness than that of the material to be abraded, provided that the substances are used at high velocity.

The more rapid the movement of the abrasive agent on the surface to be abraded and the more efficient the abrasion, the less painful the procedure for the patient, and the better the preservation of the abrasive instrument, since abrasion at slow velocity is detrimental to abrasive instruments. The velocity at which an abrasive instrument is used in dental practice depends on the quantity of friction heat, which originates in velocity. High velocity is accompanied by a great production of heat, but the procedure is well tolerated, provided that the application of the abrasive to the sensitive regions is of short duration and without pressure.

Polishing differs from abrasion in that whereas abrasion wears away the superficial layer of material of the abraded surface, polishing merely raises the temperature of the polishing surface, fluidifies the polishing surface by fusion, removes the fluidified atoms from the surface and redistributes them evenly in the form of a film (Beilby's) on the same surface. The essential requirement for obtaining a good polish is the use of a substance for fine polishing. The surfaces to be polished are under friction by velocity but never under pressure. A disk of soft felt can be used at a lineal velocity of from 7,500 to 10,000 feet a minute. In the mouth a disk of soft rubber, with a paste of zinc oxide or with alcohol, can be used as a polishing agent. The dental instrument should be used at the greatest velocity possible without pressure. Pressure produces great heat and causes deterioration of the dental instrument and of the polishing material.

Abrasive materials are classified according to their texture in passing through a standard sieve. An abrasive substance marked no. 8 passes through a sieve of eight perforations to an inch but it will not pass through sieves with smaller perforations. On this basis the materials are classified as numbers from 6 to 220. The grains of abrasive substances which pass through sieves of 220 perforations are considered powders, and they are classified according to their more or less fine texture as F, FF, FFF, and so forth, or in the case of abrasives used on paper in 0, 00, 000, 0000, and so forth.

Restrictions to the hygroscopic and setting expansion of dental investments determined by different types of casting rings (Behavior of hygroscopic expansion in the water-added technic)

(Restricoes a expansao higroscopica e expansao de presa de um revestimento ocasionadas por diferentes tipos de aneis para fundicoes)
(Comportamento da expansao higroscopica em funcao da tecnica de agua acrescida)

Leo Werner Suffert and Manoel Frajndlich. *Rev. Gaucha Odont.* 4:37-52 April-June 1956

The dental profession is becoming more interested in the casting technic involving hygroscopic expansion. The first radical modification of the technic was that presented by Asgarzadeh in 1953.

Hygroscopic expansion occurs when the investment is placed in intimate contact with water, and the expansion is greater when there is a short interval between mixing the investment and placing it in contact with water. In reality this phenomenon is common to all methods that line the casting ring with an asbestos strip. Therefore all casting methods use, in some degree or other, setting, hygroscopic and thermal expansion of the investment.

Any volumetric change in an investment can be evidenced in a graduated capillary tube on one end of which is fixed a rubber bulb filled with water. The rubber bulb is placed in the center of a casting ring in which is poured recently mixed investment. As the dimensions of the bulb vary, the column of water in the capillary tube ascends or descends.

The setting expansion of dental investment attains different values when it takes place in different containers. In this research project three different types of casting rings were used: a rigid ring, an expandable metallic ring composed of

four movable parts, and a flexible ring. The expandable metallic ring permits the full setting expansion of the investment without using an asbestos liner. An asbestos liner in the ring always adds a hygroscopic element to the expansion.

Experience showed that the expandable ring opened more at the top than at the bottom. It was then decided to use rings made of a flexible material called "korogel."

This knowledge and equipment were used to measure the expansion that occurs when water is added to a dental investment when it is setting. This is the so-called water-added technic.

In a rigid ring without asbestos liner, with or without adding water, the setting expansion (because it is constricted by the rigid walls) is directed inward and actually compresses the rubber bulb located in the center of the setting investment. If the rigid ring is lined with asbestos, the capillary tube indicates an expansion of the rubber bulb.

In the expandable ring the expansion is much greater with the water-added technic. Also, the figures are higher still, both for setting expansion and for water-added technic, in the flexible ring.

It was decided to use only the flexible korozel ring when attempting to measure the hygroscopic expansion variations on increasing the amount of water added to the setting investment.

For a 26 Gm. mixture of investment, the hygroscopic expansion increased as the water added increased from 0.6 to 1.2 cc., after which the expansion dropped suddenly.

Cobalt-chromium alloys in dentistry

R. Earnshaw. *Brit.D.J.* 101:67-75 Aug. 7, 1956

The casting process was introduced into dentistry by Philbrook in 1897, and popularized by Taggart ten years later. From then until recently, gold and gold-based alloys were the materials most widely used for all cast dental restorations. In the last 20 years, however, the increased cost and reduced supply of gold have led to the introduction of several alternative materials for the larger cast dental restorations. Of these, the most popular has proved to be a group of alloys based on cobalt and chromium, known industrially as the stellites. The stellites were developed by Elwood Haynes in the United States. In 1949 it was estimated that in the United States five times as many cast dentures were made of these alloys as were made of gold alloys. In 1950 cobalt-chromium alloys became available for dental use in Britain. Since the casting technics associated with most of the dental alloys require expensive equipment and specially trained technicians, the fabrication of dental appliances from these alloys has tended to become concentrated in large commercial laboratories or in dental hospitals and schools.

The constitution of these alloys is essentially a solid solution of about 70 per cent cobalt and 30 per cent chromium. Any great departure from this ratio leads to impaired mechanical properties and decreased tarnish resistance, although within wide limits cobalt can be replaced by nickel; this lowers the cost and also the melting point of the alloy and renders it softer and more ductile. The high chromium content confers passivity on the alloy and is mainly responsible for its high resistance to corrosion.

The metallography, tensile properties, specific gravity and hardness of the alloys are discussed and the casting technic is explained. If the limitations of cobalt-chromium alloys are considered when work is designed, satisfactory restorations may be constructed.

Accelerating effect of amines on polymerization of methyl methacrylate

G. M. Brauer, Ruth M. Davenport and William C. Hansen. *Mod.Plastics* 34:153 Nov. 1956

Tertiary amines have been used for years as accelerators for the peroxide-initiated polymerization of room temperature cured acrylic resins. These accelerators permit the rapid polymerization of monomer-polymer slurries. Such mixtures have found application as dental filling resins, cements and denture base materials.

The results of a qualitative investigation of the polymerization of monomer and a number of monomer-polymer slurries in the presence of about 60 amines were studied. An ultrasonic vis-

cometer was used to follow the course of the polymerization of methyl methacrylate at 37° C. in the presence of the most efficient benzoyl peroxide-amine systems. The reaction proceeds fastest in the presence of tertiary amines. With many amine-peroxide systems, the polymerization reaction does not go to completion.

The relative order of efficiency of amines in the polymerization of monomer-polymer slurries is not always the same as that found in the polymerization of monomer. Polymerization with N,N-dimethyl-p-toluidine or 2,2'-(m-tolylimino) diethanol gave products having the best physical properties. Improvement of some physical properties, such as indentation and recovery, is obtained with a decrease in setting time. With effective amine accelerators colored products are formed.

Alloys of gallium with powdered metals as possible replacement for dental amalgam

Denton L. Smith and Harold J. Caul. *J.A.D.A.* 53:315-324 Sept. 1956

The metallic element gallium has a melting point of 29.78°C. and a boiling point of 1,983°C.—one of the longest liquid ranges of the metals. Gallium expands 3.4 per cent in volume during solidification. It has the property of wetting many materials, including tooth structure. It is essentially nontoxic. Experiments were undertaken to determine whether gallium might be used instead of mercury as a component in a filling material.

The following alloys of gallium with powdered metals and alloys were made and found to harden at room or body temperature: 40 per cent gallium-60 per cent gold, 35 per cent gallium-65 per cent nickel, 38 per cent gallium-60 per cent nickel-2 per cent silicon, 35 per cent gallium-55 per cent nickel-10 per cent cobalt, 35 per cent gallium-65 per cent copper, 40 per cent gallium-60 per cent cobalt; and 35 per cent gallium with the following copper-tin alloys: 90 per cent copper-10 per cent tin, 73 per cent copper-27 per cent tin, 68 per cent copper-32 per cent tin (speculum metal), 62 per cent copper-38 per cent tin and 41 per cent copper-59 per cent tin.

Mixtures of gallium with tantalum, chromium, molybdenum and some commercial amalgam alloys would not harden or were too weak to be of any practical value.

The 40 per cent gallium-gold alloy reacted exothermically under certain conditions and therefore was impractical for oral restorations.

The 35 per cent gallium-nickel alloy had good strength and hardness but expanded 140 to 149 microns per centimeter in two days. The expansion was reduced to about 75 microns per centimeter by increasing the amount of work done on the mix during trituration.

Cobalt powder or silicon powder added to gallium-nickel alloys also reduced the expansion, but the one day strength of the alloy was decreased by this treatment.

The 35 per cent gallium-speculum metal alloy had good strength and hardness but set slowly. It continued to gain strength during 10 days of storage at body temperature. This alloy had a setting expansion of 46 to 50 microns per centimeter.

Gallium alloys have been made with some physical properties that are adequate for oral restorations. Sufficient data on the physical properties of gallium-powdered metal alloys are not available, however, to recommend any so far investigated as possible replacements for dental amalgam.

Periodontics and endodontics

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Endodontics

Animal experiments and clinical investigations on tissue reaction to amalgam

(Tierexperimentelle und klinische Untersuchungen über die Gewebsreaktion der Amalgame in unmittelbarem Kontakt mit dem Knochenmark)

W. Eger and C. H. Fischer. *Deut.zahnärztl.Zschr.* 11:498-509 May 1, 1956

After several animal experiments, Euler (1923) came to the conclusion that no objection to the use of amalgam as filling material after apicoectomy is justified.

Recent animal experiments with dogs and clinical investigations on human patients, carried out by the combined staffs of the Conservative Department of the Dental Institute and of the Pathologic Institute of the University of Göttingen, Germany, did not confirm Euler's conclusion.

Under total anesthesia, copper amalgam was implanted on one side of the dogs' mandibles and 50 per cent silver amalgam on the other side. The animals were sacrificed 6 to 11 months after implantation.

Histologic examination revealed that the copper amalgam implants had produced fibroplasia and osteitis fibrosa cystica around the implantation site. This chronic inflammatory process, however, was limited to a comparatively small region. There was no increase of leukocytes. This seems to prove that the healing process was uneventful, and no additional significant disturbances of the tissue were caused by copper amalgam implants.

In one dog, however, unfavorable reaction to copper amalgam implantation was observed. A spontaneous elimination of the implant occurred.

Histologic examination of tissues around the 50 per cent silver amalgam implants revealed that these foreign bodies were encircled by small reactionless, fibrous capsules.

Pathologic symptoms, unquestionably caused by the reaction of the tissues to the presence of a foreign body within the organism, were numerous.

Although in most of the dogs the inflammatory reaction was insignificant because the implants were encircled by minute capsules of connective tissue, a severe chronic inflammation of tissues surrounding these capsules was observed in two dogs.

On the left side, around the copper amalgam implants, no such inflammation occurred. This deviation probably justified the conclusion that the 50 per cent silver amalgam does not possess bactericidal properties.

Copper amalgam produced a uniform tissue reaction around the implants. Characteristic for such a reaction was the broad cover of connective tissue, visible in roentgenograms as a circular area.

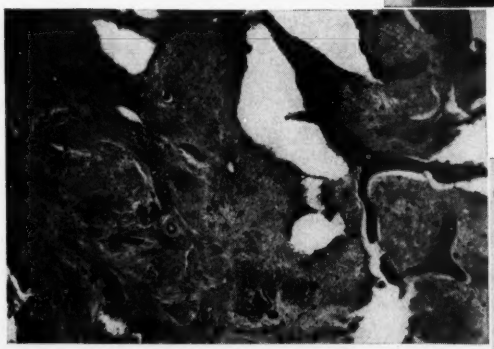
Results obtained in animal experiments must be translated to humans with caution. In human patients, clinical experience predominates for diagnostic purposes, and a comparison between the findings of animal experiments and those gained in clinical investigations often is misleading.

Therefore, the insignificant reaction of tissues to implanted copper amalgam in dogs may be in contrast to reactions in human patients, in whom destruction of osseous tissue caused by tissue reaction to copper amalgam occurred. It must be assumed that copper amalgam implants in humans did produce an activization of tissue instead of a nonreaction toward the foreign bodies, as had been observed in dogs. The reaction in human beings must be interpreted as a damaging effect caused by an increased reactivization of metabolic processes. Further histologic examinations of similar symptoms in man probably will verify this hypothesis.

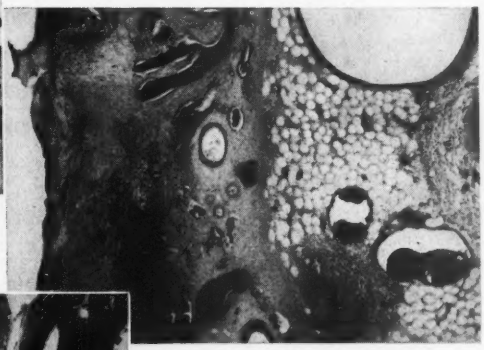
Besides histotropic and bactericidal effects, copper amalgam seems to cause certain chemical

Copper amalgam implantation in mandible of dog

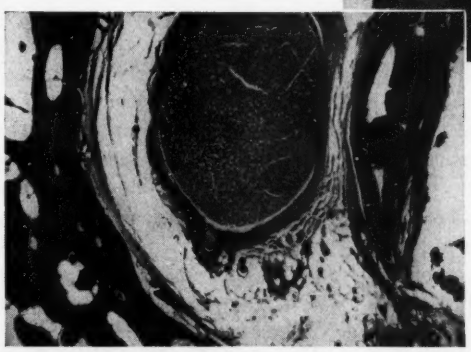
Silver amalgam implantation in mandible of dog



Silver amalgam implants; chronic inflammation in granulated tissue, atrophy of spongiosa and severe decalcification



Silver amalgam implants; necrosis and spreading of inflammatory infiltrates to bone marrow and pulp



Silver amalgam implants; small, fibrous and reactionless capsules

reactions occurring mainly between albuminous bodies (proteins) of the tissues and the freed mercury, especially in instances in which an excess of copper amalgam was allowed to remain in the apical region.

Roentgenographic and clinical examinations of 692 teeth with copper amalgam fillings revealed that the most favorable results had been obtained in instances in which no excess amalgam remained, and in instances in which apicoectomy followed the root canal filling.

Although it seems feasible to preserve teeth with nonvital pulps by copper amalgam fillings, as long as there are no additional facts available which justify this treatment method, it is recommended that the customary and clinically tested methods for root canal treatment continue to be used.

The dependence of the results of pulp therapy on certain factors: An analytic study based on radiographic and clinical follow-up examinations

Lars Z. Strindberg. *Acta odont.scandinav.* 14, Sup. 21:1-175, 1956

The influence of several factors on the postoperative course in pulpectomy and conservative root treatment was investigated clinically. The case material consisted of 254 patients with 529 teeth and 775 roots treated by the author during a six year period. Clinical and roentgenographic follow-up examinations were performed over a period of from six months to ten years. An average of 2.4 interim examinations was made for each person.

Two types of factors were studied: biologic factors, including health status, anatomic and pathologic conditions of the pulp and periradicular regions, and therapeutic factors, including forms of therapy, antibacterial treatment, canal preparation, clinical and technical complications, the root filling material and the type of root filling.

No appreciable difference was noted between those patients younger than 35 years and those older than 36 years. There was no appreciable difference between "healthy" and ailing subjects. The proportion of successes was higher for subjects with one to four teeth treated than for subjects with five to ten teeth treated during the six year period.

A higher proportion of successful operations was recorded for teeth with three roots than for teeth with two roots, which, in turn, displayed better results than single-rooted teeth. Roots with canals that could not be prepared to the apex were found to have a higher proportion of successes than those which could. There was a higher proportion of successful operations for the group with necrosis or gangrene than for the pulpitis group. Where previous pulp therapy had been performed there was no appreciable difference.

The therapeutic results were less frequently successful for patients with periradicular rarefaction than where no such changes were observed in the roentgenograms; the larger the area of rarefaction, the less chance for success. There was a tendency toward a smaller proportion of successes where apical resorption was observed. No appreciable difference was found between the groups in which the pulp was devitalized and in which it was anesthetized. No appreciable difference was established in respect of paraformaldehyde and arsenical pastes as devitalizing agents. A greater number of sterilizing dressings did not increase the proportion of successes. There was no indication that the use of sulfuric acid increased the chance of a successful operation.

The appearance of acute symptoms of inflammation during the treatment did not reduce the proportion of successes. In instances where a fragment of the broken file remained in the canal, there was a lower proportion of successes. Where the apical part of the canal was widened mechanically to a diameter corresponding only to the no. 1 Hedström file, a higher proportion of successes was obtained than where wider files were used.

No significant difference in the proportion of successes was found between groups in which a Syrian asphalt dissolved in benzine (Alytit) and resin-chloroform were used in conjunction with gutta-percha. In certain canal preparation classes there was a tendency toward a smaller percentage of successes for the Syrian asphalt material.

The group with pronounced overfilling had a lower proportion of successful operations than where there was only a slight, or no, overfilling.

A higher proportion of successes was recorded for properly sealed canals compared with those for which the roentgenograms revealed poor adaptation or shrinkage of the filling. The risk of pronounced overfilling appears to be greater where the apical part of the canal was widened with the no. 2 Hedström file or wider.

Bacteriologic examinations of the periapical region of teeth with infected root canals (Bakteriologische Untersuchungen des periapikalen Raumes an Zähnen mit infiziertem Wurzelkanal)

L. Horváth and I. Fürész, Budapest, Hungary. *Deut.zahnärztl.Zschr.* 11:186-190 Feb. 15, 1956

Bacteriologic examination of teeth with infected root canals was carried out by the combined staffs of the National Institute for Dental Education and the National Institute for Public Health, at Budapest, Hungary.

These examinations revealed that in specimens taken from 100 persons, cultures showed 37 positive for aerobic and 36 positive for anaerobic bacteria. In 63 instances, the cultures for aerobic bacteria were sterile; however, the cultures for aerobic and anaerobic bacteria, analyzed simultaneously, showed sterile root canals in only 41 patients, and infection present in 59.

In 20 patients, apicoectomy was performed after root canal treatment. The analysis of aerobic cultures established that in eight patients infections had occurred; the analysis of anaerobic cultures was positive in seven; in 12 patients, the cultures were sterile; however the cultures for aerobic and anaerobic bacteria simultaneously analyzed showed only nine negative results. These tests confirmed the fact that the most important requirement of endodontic treatment, especially in instances of infected root canals, is a proper filling reaching to the apexes.

In ten instances, the control examination by roentgenocinematography revealed no infection after endodontic treatment, but the analysis of cultures for aerobic bacteria showed infection in an isolated instance, those for anaerobic bacteria in two.

In all instances in which roentgenograms had revealed the presence of progressive bone resorption, bacteriologic examinations confirmed these findings.

In 66 instances, the root canal fillings consisted of gutta-percha pegs dissolved in chloroform by the compression technic. The presence of aerobic bacteria was established in 39 instances, the tests for anaerobic cultures were negative in 42 instances.

In 30 instances, cement gutta-percha had been used. Cultures for aerobic bacteria showed sterile root canals in 22 instances, cultures for anaerobic bacteria showed sterile root canals in only 19.

The more favorable results obtained with iodoform gutta-percha pegs can be attributed to the comparatively straight form of the roots in which this method has been used.

▼ Periodontics

Problem of hypersensitive necks of teeth (El problema de los cuellos dentales hipersensibles)

A. Zepeda A. *Bol.Col.estomat.Guatemala* 4:16-18 Jan.-Feb.-March-April 1956

Hypersensitivity of the necks of teeth is common. The patient complains of a dull pain in the neck of a tooth. The pain is temporarily intensified when he breathes through the mouth or when the tooth comes in contact with food or with the toothbrush. Clinical and roentgenographic examination of the tooth may show cervical caries only in rare instances.

The most frequent causes of the condition are the following: (1) defective calcification of the tooth at the cervical region, with consequent exposure of dentin due to lack of union of the enamel with the cementum; (2) cervical erosion and (3) cervical abrasion. Cervical erosion and cervical abrasion are due to pathologic retraction of the gingiva, which is the result of gingivitis.

The cervical damage and consequent exposure of dentin and later dentinal hypersensitivity can be controlled if treatment of the gingivitis is instituted early.

The symptomatic palliative treatment consists of the local application of a paste, which is prepared with equal parts of a 33 per cent sodium fluoride solution, white clay and glycerin. (The treatment is contraindicated in instances of exposed dental pulp or in cavities prepared for fillings.)

The causal (preventive) treatment consists of treating the gingivitis. It includes the correction of either the general or the causal factors of gingivitis or both. By treating the gingivitis, detachment of the gingiva over the neck and the consequent gingival pathologic retraction, exposure and hypersensitization of the dentin are prevented. The treatment is completed by educating the patient to practice oral hygiene.

Quantitative evaluation of the effect of toothbrushing and toothpicking

Tormod Morch and Jens Waerhaug, Oslo. *J.Periodont.* 27:183-190 July 1956

Oral hygiene has been considered one of the most valuable adjuncts in the management of periodontal disease. Recent histologic findings have demonstrated the beneficial effect of the removal of subgingival calculus for the conditions of the gingiva. Bacteria as a rule are found only in pockets where calculus or soft deposits are retained on the tooth surface below the gingival margin, and the bacteria disappear from the pockets when the deposits are removed. These findings suggest that bacteria, retained in contact with the gingiva, are the most important causative agents in the establishment of gingival inflammation and subsequent destruction of the supporting tissues.

A study was undertaken to evaluate the ability of breaking down sucrose by saliva samples collected successively before cleansing of the teeth, during toothbrushing, during toothpicking and after cleansing of the teeth. Saliva samples were collected from four persons. A rapid drop in pH was observed in all the toothbrushing and toothpicking samples, demonstrating that acid-producing bacteria had been removed from the teeth. The acid-producing capacity of the toothbrushing samples was greater than that of the toothpicking samples, indicating that most of the bacteria is removed by the brush. The considerable drop in pH in the toothpicking samples, however, shows that some other implement (toothpick or dental floss) is essential for effective oral hygiene. The drop in pH increased with the increase in time since the last oral hygiene, showing that the accumulation of bacterial plaque to a certain extent is proportional to the length of time since oral hygiene.

The conclusions are as follows:

1. The efficiency of toothbrushing and toothpicking can be evaluated quantitatively by the fermentation capacity of saliva samples collected during the described procedures.

2. The main part of the bacterial plaque on the teeth can be removed by toothbrushing.

3. In areas inaccessible to the toothbrush there will always be some bacterial plaque left that can be removed only by the toothpick (or dental floss) which demonstrates the need of toothpicks for a satisfactory oral hygiene.

4. The bacterial plaque is renewed quickly after oral hygiene.

5. The amount of bacterial plaque accumulated on the teeth is to a certain extent proportional to the length of time without oral hygiene.

6. The teeth should be brushed two times a day and toothpicks should be used once every day.

An evaluation of topical Terramycin in postgingivectomy pack

C. M. Fraleigh. *J.Periodont.* 27:201-208 July 1956

A study was undertaken to evaluate the effects of incorporating oxytetracycline in the surgical pack after gingivectomy. Fifty patients were treated. The experimental pack included 125 mg. of powdered oxytetracycline in six drops of liquid (eugenol 98 per cent and thymol 2 per cent) to which sufficient powder (Box's formula) was added to produce a very stiff mix. The control

pack was identical in composition and consistency, except that oxytetracycline was not included. Packs were placed immediately after gingivectomy. One quadrant of either the maxillary or the mandibular arch was the control and the other quadrant of the same arch was the experimental site.

In 48 of the 50 patients, clinical observations revealed that the healing was more rapid on the side where oxytetracycline had been incorporated in the pack. The epithelium covered the healing wound at a more rapid rate on the side in which oxytetracycline had been used. Of the 50 patients, 49 indicated that the side with the oxytetracycline was more comfortable. The patients noticed less odor and experienced less unpleasant taste with the packs containing oxytetracycline.

Twelve patients manifested allergic reactions during the period the antibiotic packs were in place. The onset of these allergic manifestations averaged four and a half days after the beginning of the topical therapy. There were no allergic reactions to the control packs.

The bilateral manifestations of the reactions and the lack of any manifestations of a reaction in the tissues under or adjacent to the pack containing oxytetracycline indicate these reactions were not from direct contact with the antibiotic.

Treatment of deep periodontal pockets

(Über die Behandlung tiefer Taschen)

Oskar Müller, Basel, Switzerland. *Zahnärztl. Rundschau* 65:244-249 May 20, 1956

In the early stages of periodontitis, pockets are formed in the gingiva which increase in depth. These pockets are caused by a separation of the oral epithelium from the enamel cuticle. Pocket formation is accompanied by a downward growth of the epithelium.

In these gingival pockets, food particles and bacteria accumulate and inflammation, suppuration and necrosis may follow.

Even for an experienced dentist, the treatment of deep periodontal pockets is difficult. Frequently, the pocket formation is also accompanied by swollen papillae which tend to bleed, and by atrophy of the bones.

For preliminary treatment, harsh caustics often are used which produce improvement, however, only if no implications are present. Pockets which already have reached the osseous structures should not be treated with caustics, because sequestrums can occur.

When the rarefaction of the bone has reached the apex, no known treatment provides a favorable prognosis.

When deep pockets are situated laterally to the roots, the following treatment will be successful: (1) determination of the depth of the pockets; (2) elimination of all calculus formations; (3) polishing the root surfaces with brushes, rubber sponges and pumice, and (4) suppression of the bacteria accumulated with antibiotics, preferably chlortetracycline hydrochloride.

Scaling and curettage can reduce the depth of periodontal pockets.

Subsequent surgical treatment, under local anesthesia, should consist of the following: (1) an initial cut is made from the pocket bottom to a point as near to the apex as possible, beginning at the most posterior part of the involved region; (2) similar incisions are made on both the lingual and labial aspects; (3) small parts of remaining tissue are removed with scissors; (4) the entire region is sprayed with hydrogen peroxide solution, and (5) simple mixtures of zinc oxide and eugenol are packed into the interproximal spaces.

Roentgenograms, taken a comparatively long time after the operation, will reveal whether new growth of osseous tissue has taken place.

Postoperative treatment consists in the administration of calcium preparations and vitamins D and E.

The reactivation of cells can be promoted by using Bogomoletz's method (drop by drop injection of 1 cc. of a 0.1 per cent solution of oxytetracycline hydrochloride or tetracycline hydrochloride).

Preventive and public health dentistry

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Statistical research

The dental condition of children in the area of Burzenin, Poland: the relation between living standards and general health (Stan uzebienia mlodziezy gminy Burzenin w swietle warunkow bytowych i badan ogolnoustrojowych)

Ewa Szymaniak. *Czas.Stomat.* 9:232-246 May 1956

Recently, a governmental survey has been carried out in Burzenin, Poland, and its vicinity, to evaluate (1) the dental condition of preschool and school children, (2) the living standard of the population, (3) the state of general health and (4) the relation between these factors.

The children were divided into two groups: the first, in the age range from 4 to 14, and the second, from 14 to 19. Boys and girls were examined separately.

The statistical analysis of caries incidence in the vicinity of Burzenin appeared to be of special interest to the Polish health authorities because of the comparatively low economic level of the average population, and the lack of fluorides in the drinking water.

The number of children examined was 323 (161 boys and 162 girls). No evidence of gross malnutrition was established. Carious lesions were found in 27.2 per cent of the teeth examined, and the average DMF index value was 7.66. Caries was more frequent in girls and in the higher age group.

Comparison of the percentage of caries-free teeth and the DMF index in each individual child revealed that the influence of living standards on caries incidence had been overemphasized in the Polish dental literature.

No relation exists between rickets in childhood or tonsillitis and the condition of the deciduous and permanent dentition.

By adding sodium fluorides to the drinking water, the caries-preventive action of fluorine was determined.

Defects in physical posture may have an as yet undetermined relation to susceptibility to caries.

Longitudinal technics in the study of oral disease

A. L. Russell. *Am.J.Pub.Health* 46:728-735 June 1956

A longitudinal study requires the re-examination of a specific individual at the end of a stated time interval, the comparison of the observations at the end of the interval with those from the first examination, the lumping of these observations with those from the individual's peers, and their interpretation as mean incidence, or mean change, over the period of study.

In longitudinal studies considerable examination effort is lost because of failure of subjects to appear for a subsequent examination; results are slow to emerge; frequently a series of time intervals must elapse before the data can be evaluated, and the method is costly. The longitudinal method is not the method of choice if the data required may be obtained directly through a single cross-section survey. The cross-section survey, however, cannot yield data of certain types, including the following: (1) the direct estimation of incidence (increment over a given time span) with known error components; (2) the relation between two effects which are observed (rather than assumed) to coexist through the period of study, and (3) the retrospective study, based directly on data of record, of persons in whom a given effect appears, compared with similar persons in whom the effect did not appear.

A longitudinal study was made of dental caries and periodontal disease in 5,000 to 6,000 children. These children were examined annually in representative elementary and junior high schools in districts with fluoridated water in Prince Georges and Montgomery counties, Md., in suburbs generally contiguous to the District of Columbia. The study is reported to illustrate the use of the longitudinal technic in obtaining information on chronic disease lacking or conjectural in cross-section studies.

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Caries etiology and control

Dental caries in animals living in their native habitats

(Über die Zahnfäule bei frei lebenden Tieren)

F. Rozeik. *Zahnärztl.Welt & Reform* 11/57:154 June 25, 1956

In his article "Does Dental Caries Occur in Animals Living in Their Native Habitats?" (*Kosmos* 8:371-373 Aug. 1955 and *D.Abstracts* 1:439 July 1956), Albert Keil came to the conclusion that dental caries does not occur in those animals.

Other authors, however, have reported that caries has been established in about 7 per cent of rabbits and guinea pigs examined.

To check these contrasting statements, the Dental Clinic and Polyclinic of the University of Mainz, Germany, carried out animal experiments in which 24 guinea pigs and 6 rabbits were used.

These animals were divided into five groups; some were irradiated with roentgen rays and fed a cariogenic diet.

Group 1 consisted of six guinea pigs which were irradiated with 1,000 roentgen units and fed a cariogenic diet.

Group 2 consisted of six guinea pigs which were irradiated with 1,000 roentgen units but fed a normal diet.

Group 3 consisted of six guinea pigs which were irradiated with 2,000 roentgen units and fed a cariogenic diet.

Group 4 consisted of six guinea pigs serving as control Groups 1, 2 and 3; these animals were not irradiated but were fed a cariogenic diet.

Group 5 consisted of six rabbits which were not irradiated but were fed a cariogenic diet.

The cariogenic diet (Roine) consisted of casein, 30 per cent; olive oil, 5.6 per cent; powdered sugar, 40 per cent; cellulose, 15 per cent; potassium acetate, 2.5 per cent; sodoum chloride, 6 per cent; magnesium oxide, 0.5 per cent; choline chloride, 0.2 per cent, and inositol, 0.2 per cent. To each 100 Gm. of food, the following vitamins were added: vitamin C, 0.2 Gm.; vitamin B_1, 1.6 mg.; vitamin B_2, 1.6 mg.; vitamin B_6, 1.6 mg.; calcium pantothenate, 4 mg.; biotin, 0.6 mg.; nicotinamide, 20 mg.; folic acid, 10 mg.; vitamin B_{12}, 0.004 mg.; vitamin A acetate, 0.6 mg.; vitamin E, 2 mg.; vitamin D_3, 0.004 mg., and vitamin K, 0.02 mg.

This cariogenic diet and fluoride-free drinking water were given for 150 days. Then the animals were sacrificed, their jaws dissected and all teeth examined for carious lesions.

No caries was found, but in some of the animals changes of pulp and tooth germs (especially of molars) was noted. These alterations obviously were caused by irradiation with roentgen rays.

The animal experiments were duplicated later with albino rats and golden hamsters. The results were identical.

Keil's conclusion that dental caries does not occur in animals, especially in those living in their native habitats, therefore, seems to be correct.

Preliminary study of social attitudes in relation to dental caries formation

J. H. Manhold and M. B. Jones. *Washington Univ.D.J.* 22:41-46 May 1956

The possibility that tooth decay and personality factors may be related has long been conjectured. If such a relationship exists, the resultant decay can be brought about only by the physiologic mechanisms which are dependent on, or are the result of, neurotic conditions in the organism.

The "California F Scale" is an attitudinal measure designed to detect a person prone to totalitarian ideology. A high score denotes a person prone to totalitarian ideology; a low score indicates a person resistant to such ideas. The nonauthoritarian has a relatively urbane background, professional interests and high scholastic aptitude. The authoritarian generally is at the other end of the continuum with respect to these variables.

A study was made to investigate the possibility that dental decay progresses further among nonauthoritarians than among authoritarians. The subjects were naval aviation cadets at the U.S. Naval Air Station, Pensacola, Fla. Three samples

consisting of 300, 233 and 474 subjects, respectively, were collected. The systems of measurement employed were the California F Scale, Form 40-45, and a DMF rating.

Those in the first sample who scored in the lower 27 per cent on the F Scale had a higher mean DMF rating (29.70) than did those in either the middle 46 per cent on the F Scale (27.15) or the upper 27 per cent (27.15). In the second sample of 233 cadets, those in the lower 27 per cent on the F Scale had a mean DMF rating of 31.43, compared with a mean DMF rating of 26.49 for those in the combined middle and upper group. In the third sample of 474 cadets, the respective DMF ratings were 32.74 and 30.38.

The degree of authoritarianism–DMF relationships, although statistically significant, were not of great magnitude. From the results of this preliminary investigation, however, it would appear that persons who hold nonauthoritarian attitudes have a higher incidence of dental caries than do their more authoritarian peers. Thus, another indication of the acceptability of the psychosomatic theory for dentistry has been advanced. Further empirical testing of the hypothesis is under way.

Dental caries susceptibility tests and their significance in dental practice

A. Kroncke and R. Naujoks, Hamburg. *Internat.D.J.* 6:174-188 June 1956

In contrast to the caries status as revealed in a single examination, caries susceptibility is a pathologic process which shows obvious carious changes in the course of a longer period of observation. The diagnosis of caries resistance can be made only through long-term clinical observation.

A caries susceptibility test is important for the scientist and for the dental practitioner. It helps to establish the choice of suitable therapeutic measures.

If the applicability of a caries test is to be beyond any doubt, the following conditions must be met:

1. The diagnosis of the test must be certain and must have a close correlation to the actual clinical caries susceptibility. The result must be reproducible and the method free of technical inaccuracies.

2. The test must be easy, simple, inexpensive and conducted with the equipment available in practice.

3. The time needed for the test should not exceed a certain limit and the result of the test must be available as soon as possible.

Of the clinical methods for evaluating caries susceptibility, only those give reliable information which depend on morphologic changes and require six months or more before a final diagnosis can be made. Thus they fail in their practical purpose–early treatment and advice to the patient.

The method of choice in dental practice, therefore, will be bacteriologic and biochemical caries tests. As to the lactobacillus test, its accuracy is questionable and it is not simple. The Snyder test nearly fulfills the postulates, but possible inaccuracies should not be underestimated.

The pH, the buffering capacity, the amylase activity and the Wach test need further investigation until a reliable and good correlation with the actual caries susceptibility can be secured.

The oxygen uptake test guarantees reasonable certainty in the diagnosis and the result is available quickly. The test, however, requires costly equipment and trained personnel.

At present there is no caries susceptibility test which can be recommended unreservedly.

Fluoridation of water supply: the Norway, Maine, study

Alonzo H. Garcelon. *New England J.Med.* 254:1072-1077 June 7, 1956

The assumption that at least five years is required for the beneficial effect of imbibing fluoridated water to begin to become apparent is an unwarranted conclusion. A study was made to determine whether the beneficial effects attributable to the use of fluoridated water begin to become apparent in less than five years.

Norway, Me., in October 1952, began adding sodium silicofluoride to its water supply to maintain a total concentration of 1 ppm of fluoride. In the same month, inspections were made of the

teeth of all children enrolled in the elementary grades; inspections were again made in April 1955. In six year old children the average DMF rate fell 80 per cent from 1952 to 1955; in seven year old children, 71 per cent; in eight year old children, 32 per cent, and in nine year old children, 28 per cent. Other studies have indicated that similar reductions in the average DMF rate have been experienced within similar periods after fluoridation was started.

The proportions of children entirely free of dental decay in permanent teeth in Norway, Me., rose by 187 per cent for seven year old children from 1952 to 1955, and by 133 per cent for eight year old children. The percentage increases for other young age groups were not significant statistically.

It is readily apparent that, in the short space of 30 months, fluoridation of the town water supply has produced statistically significant reductions in the average DMF rate in permanent teeth among Norway children six to nine years old, and statistically significant increases in the percentages of seven year old and eight year old Norway children entirely free of dental decay in permanent teeth.

Relationship between the electrical resistance of human teeth and the presence and extent of dental caries

J. M. Mumford. *Brit.D.J.* 100:239-244
May 1, 1956

While investigating the electrical resistance of normal and carious human teeth, it was noticed that when the electrode was placed on a carious area the resistance was less than when the electrode was placed on a normal area. The relation between the resistance and the presence and extent of dental caries was therefore investigated *in vitro* and *in vivo*.

A dry battery was used to pass a current through the tooth from the outer surface to the pulp. The current was measured by a microammeter in series and the potential drop by a voltmeter placed across the tooth and microammeter. The resistance through the tooth was then determined by Ohm's law. The following conclusions were reached:

1. The highest resistances are found for normal areas of enamel.
2. The resistance is lower when the enamel is fissured.
3. It is lower still when there is caries in the dentin and becomes less as caries approaches the pulp.
4. It is least for teeth in which caries has reached the pulp.
5. An approximate correlation is demonstrated between the resistance and the depth of the fissure or caries.

As a means of diagnosing the presence and extent of dental caries, the method achieved successful discrimination in 37.3 per cent of 193 teeth tested. Factors which influence the resistance readings are enumerated.

Inhibition of acid formation from carbohydrates by stannous fluoride and stannous chlorofluoride

B. Lilienthal. *Austral.D.J.* 1:165-173
June 1956

Stannous fluoride, stannous chlorofluoride and stannous chloride were shown in experiments to inhibit acid production by salivary sediment from glucose. The concentrations of these compounds necessary to inhibit acid production in these conditions were M/20,000 [7.9 ppm], M/18,000 [9.6 ppm] and M/7,000 [27.1 ppm], respectively. The inhibitory effect was shown to be unrelated to the fluorine content and was proportional to the tin concentration. Calcium and phosphate in concentrations similar to those found in saliva did not influence the inhibitory action of stannous fluoride.

With an artificial plaque and also with a bacterial plaque *in situ* stannous fluoride decreased the rate of acid production from glucose.

Studies of stannous fluoride and sodium fluoride in saliva-carbohydrate mixtures showed that the former at M/3,000 concentration prevented pH change whereas sodium fluoride at a greater fluorine concentration (M/1,000) did not produce such a pronounced effect.

The fluoridation question

Editorial. *J.Am.Hospital A.* 30:35 June 1, 1956

The fluoridation issue is being debated in many communities. In some instances this sound health measure is being defeated by unscientific but shrill campaigns.

The American Hospital Association has joined other leading health organizations in supporting the fluoridation of water supplies as in the public interest. Hospital administrators should join their health colleagues in the fight for fluoridation. Though not directly related to hospital care, the issue is related to the health of people.

Hospital administrators who actively support the fluoridation efforts will be working in the public interest.

Relation between caries and nutrition in children (Remarques sur la carie dentaire et l'alimentation chez l'enfant)

P. G. Mouriquand. *Rev.franç.odontostomat.* 6:677-681 June-July 1956

The pathogenesis of dental caries still is obscure in spite of numerous articles on the effects of saliva, sugar and infections. Does a relation exist between caries and a dietary imbalance in children, especially when only "soft" food is consumed?

The malnutrition experienced during World War I and II, although affecting unfavorably the growth and development of the osseous structures (including that of the jaws), seems to have caused a gradual decrease in caries incidence. After the end of the wars, it was followed by a rapid increase.

Rickets, which increased during the wars, affected tooth development and eruption but not caries incidence.

According to recent research, lack of dental enamel, frequently of embryologic origin, is not a certain causative factor in caries development.

The dentition of healthy children, adequately nourished, seems to possess a stronger resistance to caries than the dentition of adults.

The relation between different types of avitaminosis and caries has not been established with certainty, although some types (A avitaminosis, C avitaminosis, D avitaminosis, and phosphorus-calcium dietary imbalance) are suspected to be cariogenic factors.

Further and profound research is necessary to provide satisfactory answers to the many questions constantly asked by pedodontists and embryologists in regard to the possible relation between dental caries and nutrition in children.

Diet and dental caries (Dieta y caries dental)

Omar Olano. *Odont.uruguaya* 10:7-18 Jan.-Feb. 1956

Several factors are responsible for the production of dental caries. One factor is carbohydrates in the diet.

A correct diet during the formative stages produces a healthy, well calcified tooth. This calcium, once deposited during the growth of the tooth, is stable, even in the presence of such illnesses as osteomalacia.

The calcified dental tissues produced by a correct and well balanced diet do not create resistance to dental caries, because this latter condition is a decalcification produced by acids that dissolve the mineral salts of the enamel.

All investigations lead to the conclusion that one element of diet, the carbohydrates, are connected with dental caries. Saliva taken from persons who are prone to dental caries shows the presence of *Lactobacillus acidophilus.* This does not mean that other bacteria, such as streptococci and staphylococci, are not able to produce acids. Research by Orland shows that all microbes, in one way or another, are related to dental caries, and that the bacterial is the most important factor in caries.

Statistical data permit one to appreciate the caries propensity of a given mouth based on the *Lactobacillus acidophilus* count, and to advise the reduction of carbohydrate consumption. The critical figure is 10,000 bacteria in every 1 cc. of saliva.

Chemical make-up is not the only caries-producing factor of the carbohydrates. A few minutes after the intake of carbohydrates, the

normal pH of saliva, which is 6.8 to 7.2, drops to pH 5. In 20 or 30 minutes the pH tends to recover its normal figure. Therefore, if every intake produces acidity of the saliva, the number of times a child eats or drinks carbohydrates becomes more important than the total quantity he takes.

The adhesiveness of carbohydrates to the tooth surface is another factor that contributes to decay. Wheat flour is more adhesive than corn or rice.

Solid sugars usually remain longer in contact with the tooth than liquids, such as sweet drinks.

A decrease in the quantity of sugar taken by the child not only decreases the *Lactobacillus acidophilus* count, but benefits the general health because it allows other and more important food to be eaten, such as amino acids, vitamins and mineral salts.

Relative solubility of the intact enamel surfaces of primary and permanent teeth

Early R. Ley, Marjorie L. Swartz and Ralph W. Phillips. *J.Den.Children* 23:84-85 June 1956

A study was undertaken to measure the rates of dissolution of the outer layer of intact enamel from deciduous and permanent teeth. Twenty-two sound deciduous teeth and 22 sound permanent teeth were placed in tap water immediately on extraction and a window type test made, in which an area of enamel 2.0 mm. in diameter was exposed for a period of 40 minutes to 10 ml. of a pH 2.5 acetic acid solution. The teeth were mechanically agitated in the solution, removed, rinsed and the rates of calcium solubility analyzed by the method of Solomon, Gabrio and Smith.

Although the average solubility of the deciduous tooth enamel was 10.4 per cent higher, it is not believed that the difference is significant. The small difference noted could not account for variations in caries incidence in the deciduous or permanent tooth. Susceptibility to caries would have to be attributed to factors other than differences in the resistance of the enamel to acid.

New diet for experimentally produced caries in rats (Eine neue Kostform für Versuche über experimentelle Zahnkaries bei Ratten)

H. D. Cremer and F. Rozeik. *Deut.zahnärztl. Zschr.* 11:271 March 1, 1956

At the Dental Institute of the University of Mainz, Germany, an experiment with 55 albino rats was carried out to establish whether caries can be produced experimentally by xerostomia after surgical extirpation of the salivary glands.

The result of this animal experiment has been published in *Zahnärztl.Reform* 56:458-461 Dec. 1955, and *D.Abstracts* 1:515-516 Sept. 1956.

The cariogenic diet used with strains of albino rats nonsusceptible to caries consisted of the following: 50 per cent shredded barley, 25 per cent fish meal and 25 per cent powdered sugar.

It was established that this diet, in spite of its high content of shredded barley which is difficult to masticate and its comparatively low content of monosaccharides, is extremely cariogenic.

Further experiments will determine whether the same diet used with rat strains susceptible to caries will have the same cariogenic effect even if xerostomia is not produced artificially. These future tests will also include a diet in which saccharoses (sugar) are replaced by other carbohydrates such as starches, celluloses and gums.

Cause and prevention of dental caries (Studi sulla etiologia della carie dentale e idee sulla futura profilassi)

A. Arletto and G. L. Colico. *Ann.stomat.,Roma* 5:95-105 March-April 1956

In recent Swedish dental literature, Steeling and Gustafson's experiments have been described, in which caries has been produced artificially by feeding a cariogenic diet to rats.

At the Dental Clinic of the University of Milano, Italy, Steeling and Gustafson's experiments now have been duplicated and the results rechecked. A similar cariogenic diet has been fed to golden hamsters instead of rats, because hamsters are less susceptible to caries than certain strains of rats. To the diet of one group, fluorine has been added.

Both the Swedish and the Italian animal experiments have established that caries can be produced artificially, and that resistance to caries can be increased by adding fluorine to an otherwise cariogenic diet.

Future studies on caries prevention should be directed toward administering internally substances (such as fluorine) which are able to alter the trophic function of dental tissues, and to stimulate the local and general defense mechanism.

By clinical studies and laboratory tests, caries research will be able to determine whether stimulation of the defense mechanism can immunize the teeth against caries.

During recent decades, caries has become a widespread disease of social importance; therefore, cooperation between dentists and the public health authorities is necessary to cope with the damage, complications and the enormous expense caries has caused humanity.

Research and experiments on all phases of caries etiology and prevention should be sponsored and financed by national governments to obtain, before another decade has passed, a therapy, based on biologic principles, that will replace the present restorative and surgical therapy.

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Public health dentistry

Dental public health and social dentistry (Odontologia sanitaria e social)

Paulo O. Chaves. *Rev.Gaucha odont.* 4:53-54 April-June 1956

These two fields in dentistry have clear-cut duties, public health being preventive in nature, and social dentistry oriented toward dental treatment. The former is prophylactic in its outlook, the latter therapeutic.

The need to solve the health problems of large human groups led to these specialized activities, and their creation was not arbitrary.

Dental public health deals with the prophylaxis of oral diseases. It plans to reduce or eradicate such diseases by removing or modifying the etiologic factors involved. It is concerned principally with the individual at the beginning of his life, before the initiation of dental and oral ills. Dental caries is the major problem at present.

Its final goal is to place the individual, through hygiene and other sanitary and epidemiological measures, in a media where there will be both good health and contentment.

Whereas general public health is concerned with mortality due to disease, dental public health seeks to arrest tooth mortality.

Social dentistry aims at giving adequate and timely dental treatment to every person who is in need of it. Different schemes have been evolved, but the most effective is private insurance in countries of great financial power and high living standard, and state insurance in countries with directed economies.

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School dentistry

Organization of school dentistry in Switzerland (Organisation der Schulzahnpflege in der Schweiz)

M. Gutherz. *Schweiz.Mschr.Zahnhk.* 66:482-491 May 1956

Although most European countries have made dental treatment available universally to school children on a public health (socialized) basis, Switzerland had to approach this problem in accordance with its particular federalistic structure.

The creators of school dentistry in Switzerland have studied the different systems used in European and American countries, and have selected the method governing organization of school dentistry best adapted to the local conditions in the different cantons.

The most widely employed form is treatment by local practicing dentists which, if necessary, is subsidized by the cantonal authorities. This type of school dentistry includes today 585 licensed dentists in 1,092 communities with about 190,000 school children.

In cities and towns of the Swiss midland, however, 40 dental clinics exist in which 81 dentists

are employed, most of them full time. Some cantons with a less dense population have mobile dental units. Eight of these units serve about 120 Alpine communities with about 10,000 school children, and dental treatment is given by ten full-time dentists.

Of the 500,000 children attending elementary schools, 320,000 receive dental care by some of the afore-mentioned means. Licensed dentists treat about 80,000 children. Altogether, 80 per cent of Swiss school children are under constant dental observation. The remaining 100,000 children are examined once or twice yearly during the compulsory school year.

It is hoped that within a short time, all Swiss school children can be included in the periodic dental care to be provided by dental clinics in all schools.

▼ Miscellaneous

State of health of the mountain tribes of Karakorum (Der Gesundheitszustand der Bergvölker im Karakorum)

W. Brendel. *Umschau* 56:494-496 Aug. 15, 1956

Karakorum, the great mountainous region between the western Himalayas on the south and the western Kunlun Shan on the north, includes (1) Northern Foreland with the Karakorum pass; (2) the main chain of high summits north of the great glaciers, extending westward to the Hindu Kush and eastward into the Tibetan highland; (3) Southern Karakorum, and (4) the Cadok chain. Many peaks are steep, and 60 mountains rise above 22,000 feet.

The Frankfurt Himalaya expedition (1955) studied the state of health of the population in the dry highlands of the larger tributaries of the Indus river in the Karakorum region, from Kashmir to the Hunza valley in the northwest, the Shigar valley in the northeast and to the Shayok in the east.

The Karakorum region is inhabited by three different, ethnologically interesting people, the Baltis, Ladakhis and Hunzas. These are mountain tribes, for centuries untouched by modern cultural and political influences; present-day science still knows little about their civilization.

Recently, many reports have been published in the international literature of several branches of science in regard to the state of health of these people, especially the Hunzas. The majority of these reports, however, have been exaggerated. Simple nutritional habits and primitive life-preserving instincts have not resulted in an excellent health condition. It is not true "that their language has no appropriate term for disease or sick," as it was stated in one of these reports.

The spoken language is a mixture of Tibetan, Ladakhi and Burushaski. It has no relation to any other language. The religion is not of a single origin, and is not shared by any other people.

The dental and medical staff of the Frankfurt Himalaya expedition examined many diseased natives of the Karakorum region. Although clinical examination was difficult because the religion prohibits that any part of the human body should be bared before a stranger's eyes, or be touched by a stranger's hands, 429 men, 325 women and 281 children were examined. The findings were as follows: 518 instances of ocular diseases; 157 of alimentary disturbances; 98 of ankylosis or rheumatism; 72 of tuberculosis and diseases of the respiratory system; 60 of trauma or burns; 14 of cardiac and circulatory diseases; 2 of poliomyelitis; 2 of malignant tumors, and 346 of dental caries or periodontal disease. The mortality rate is comparatively high, especially among children.

These examinations reveal that the population of the Karakorum region is not in an excellent state of health. This contradicts most of the previously published reports.

In spite of the hard and unfavorable environment, and of the many and various diseases present, the mountain tribes are peaceable, content, hospitable and cheerful. Rightfully, as stated in other reports, they can be called "a happy people."

Doctoral and Masters' dissertations

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In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

Autotransplantation and the growth of the zygomaticomaxillary suture. *Mark Watanabe. 1956.* M.S. *University of Illinois.*

Determination of cephalic index from the lateral head x-ray. *Jack McKenzie Wright. 1956.* M.S. *University of Illinois.*

Relations between widths of the face, teeth and dental arches. *James E. McIver. 1956.* M.S. *State University of Iowa.*

Storage procedures on human and guinea pig's teeth; a histological evaluation. *John Rosen Peterson. 1956.* M.S. *State University of Iowa.*

A three segment approach to arch measurement, with particular reference to age changes and tooth positioning. *Pramod M. Soparker. 1956.* M.S. *State University of Iowa.*

A longitudinal study of skeletal face height in girls 5 to 13 years of age. *Erik S. Telle. 1956.* M.S. *State University of Iowa.*

Microscopic investigation of root canal diameters with a review of the literature. *Edward Nathan Green. 1956.* M.S. *University of Michigan.*

Phoronomy of jaw movement. A preliminary study to establish a method for the investigation. *Donald Kepron. 1956.* M.S. *University of Michigan.*

Histologic study of the teeth and bones of a four year old boy. *Edwin George Broffman. 1956.* M.S.D. *University of Southern California.*

A study of the effects of mesiodistal reduction of mandibular anterior teeth. *Arthur Leroy Hudson. 1956.* M.D.S. *University of Southern California.*

A study of acidogenic activity in saliva in relation to orthodontic appliances. *Joseph Hyman. 1956.* M.S.D. *University of Southern California.*

The classification, analysis, control and improvement of child personalities. *Carl Edward Kimbrough. 1956.* M.D.S. *University of Southern California.*

An investigation of certain autonomic responses of children to specific dental stress. *Thompson M. Lewis. 1955.* M.S. *University of Washington.*

A serial cephalometric analysis of growth of the maxilla and eruption of certain maxillary teeth. *Blaine S. Clements. 1956.* M.S. *University of Washington.*

Examination of the possible relations between the activity of the masseter muscles and the changing dentition in children from 8 to 12 years old (Untersuchungen über die Beziehungen zwischen der Massetertätigkeit und Gebiss bei 8-12-jährigen Kindern). *Gertrud Pirmann. 1953.* DR. MED.DENT. *University of Freiburg/Breisgau, Germany.*

Surgical methods in cleft lip and cleft palate (Zur operativen Behandlung der Hasenscharte). *Erika Aretz. 1953.* DR.MED.DENT. *University of Freiburg/Breisgau, Germany.*

Demonstration on enlarged wax models of regional ramifications of root canals of human teeth (Die Darstellung der Regio ramificationis and den Wurzelkanälen menschlicher Zähne im vergrösserten Wachsmodell). *Editha Scheele, 1954.* DR. MED.DENT. *University of Göttingen, Germany.*

Relationship between fluoride application and caries incidence (Zur Frage der Beziehungen

zwischen Fluor und Kariesfrequenz). *Branslav Vuceljik. 1954.* DR.MED.DENT. *University of Göttingen, Germany.*

Histopathologic studies of pulps after cement fillings (Patho-histologische Bilder von Zahnpulpen nach Zementfüllungen). *Herrad Henning. 1954.* DR.MED.DENT. *University of Greifswald, Germany.*

The dentition of the Prosimiae (Der Zahnbau der Prosimier). *Ilse Keller. 1954.* DR.MED.DENT. *University of Greifswald, Germany.*

Evaluation of bending tests to determine endurance, with regard to degree and method of polymerization of the plastic denture material "Piacryl" (Bestimmungen der Dauerbiegefestigkeit in Abhängigkeit vom Polymerisationsgrad and Polymerisationsart mit den Prothesenkunststoff "Piacryl"). *Horst Gil. 1955.* DR.MED.DENT. *University of Halle, Germany.*

The influence of pressure on the bubble formation during polymerization of plastic dental materials (Der Druckeinfluss während der Polymerisation zahnärztlicher Kunststoffe auf die Blasenbildung). *Hellmuth Wagner. 1954.* DR.MED.DENT. *University of Halle, Germany.*

Significance of the mandibular midline for orthodontic diagnosis: the technic of determination (Die Bedeutung der unterkiefereigenen Mittellinie für die kieferorthopädische Diagnostik: Die Technik ihrer Bestimmung). *Franz Lutovsky. 1954.* DR.MED.DENT. *University of Halle/Saale, Germany.*

Properties and effectiveness of the emulsion disinfectant "ED 84" in the treatment of gangrene (Eigenschaften und Wirksamkeit des Emulsiondesinfiziens "ED 84" bei der Gangränebehandlung.) *Hans Ulrich Janusch. 1955.* DR.MED.DENT. *University of Halle/Saale, Germany.*

Influence of the customary polymerization methods on the flexibility of the acrylic material "Piacryl" (Der Einfluss der in der zahnärztlichen Praxis üblichen Ver- und Bearbeitung von Kunststoffen auf den Spannungszustand des Prothesenmaterials "Piacryl"). *K. H. Zorowka. 1954.* DR.MED.DENT. *University of Halle/Saale, Germany.*

Causative factors of postoperative lockjaw (Beitrag zur Frage der Ursache eines postoperativen Wundstarrkrampfes). *Winfried Buchczik. 1954.* DR.MED.DENT. *University of Frankfurt/Main, Germany.*

The antibacterial effectiveness of phenyl mercury borate (Die antibakterielle Wirksamkeit von Phenylquecksilberborat). *Mathilde Hesedenz. 1953.* DR.MED.DENT. *University of Mainz, Germany.*

Roentgenographic investigation of the anlage of the dental germs of mandibular third molars and the time of their development (Röntgenologische Untersuchungen zur Frage der Anlage des Weisheitszahnkeimes im Unterkiefer und seiner zeitlichen Entwicklung). *Sigrid Wagner. 1953.* DR.MED.DENT. *University of Mainz, Germany.*

Investigation of the applicability of "Palavit" for tooth fillings in conservative dentistry (Untersuchungen über die Anwendung von "Palavit" als Füllungsmaterial in der konservierenden Zahnheilkunde). *Edith Schiermeyer. 1954.* DR.MED.DENT. *University of Marburg/Lahn, Germany.*

Reciprocal relations between earache and toothache (Wechselseitige Beziehungen zwischen Ohr- und Zahnschmerz). *Hanne Hock-John. 1954.* DR.MED.DENT. *University of Erlangen, Germany.*

Experimentally produced caries in Syrian golden hamsters (Untersuchungen über Karieserzeugung bei syrischen Goldhamstern). *Thorwald Schönauer. 1954.* DR.MED.DENT. *University of Hamburg, Germany.*

The caries prophylactic effectiveness of parenteral and oral administered magnesium fluoride in Syrian hamsters (Die kariesprophylaktische Wirksamkeit parenteral and per os verabreichter Magnesiumfluoridgaben beim syrischen Hamster). *Johanna Kühn. 1955.* DR.MED.DENT. *University of Tübingen, Germany.*

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CONTRIBUTING
ABSTRACTERS

Finnish, Russian
PAULA GOLLICK
BARBARA KESSLER, M.D.

Greek
THEO. J. CALOCASSIDES, D.D.S.

Japanese
MASAO ONISI, D.M.SC.

Scandinavian
MARIE USSING NYLEN, D.D.S.

Spanish-Portuguese
ELOISA DEBARROSO
JOSEFA THORNTON
GEORGE FRENCH, D.D.S., M.D.

Medical
A. F. BARANOFF, D.D.S.